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A Proposed Curriculum in Extension Education for In-Service Training of Agriculture Field Assistants in Guyana.

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A PROPOSED CURRICULUM IN EXTENSION EDUCATION FOR IN-SERVICE TRAINING OF AGRICULTURE FIELD ASSISTANTS IN GUYANA

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ABSTRACT

The Extension Education and related Social Science curriculum proposed in this study for in-service training of Agriculture Field Assistants in Guyana was developed in accordance with the Tyler rationale for curriculum development.

The procedure adopted to determine training needs was as follows:

1. Comparative analysis of the personal and job profiles of the Agriculture Field Assistants, the prospective learners, to determine inadequacies in their educational background that need to be corrected.
2. Review of literature pertaining to (a) the pre-service training program for Agriculture Field Assistants currently being offered at the Guyana School of Agriculture, (b) the 1976-1980 Guyana Agricultural development plan, (c) the current farming situation in Guyana, (d) the commercial and non-commercial agri-support activities available in Guyana and (e) the agri-milieu in Guyana.
3. Analysis of selected concepts in Extension Education and related Social Sciences considered important for the Extension job.
4. Suggestions from Extension and Training specialists with regard to the training needs of the Agriculture Field Assistants.

The training needs of the Agriculture Field Assistants provided the basis for the formulation of the following teaching objectives of the curriculum:

1. Given a list of 38 concepts from Extension Education and related Social Sciences, the Agriculture Field Assistant will be able to

recall (write) the definition of each concept without the aid of references.

2. Given a list of 38 concepts from Extension Education and related Social Sciences, the Agriculture Field Assistant will be able to write a short paragraph explaining the context in which each concept is used and its value to Extension.
3. Working under the supervision of an Extension Specialist, the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to develop and implement an Extension program for his district.
4. Working under the supervision of an Extension Specialist the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to develop and use a plan of work and a teaching plan.
5. Working under the supervision of an Extension specialist, the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to evaluate his Extension program, prepare a report of his evaluation, and use the findings of his evaluation to improve his program.

Learning experiences which were considered appropriate for the attainment of the above objectives were as follows:

1. Lectures and group discussions in the classroom.
2. Library research.
3. Seminars and group discussions.
4. Field workshops.

The selection and organization of these four learning experiences would depend on the judgement of the instructor, which would be influenced

by such factors as his leadership ability, the needs of the learners, the subject matter, the equipment and materials available, and the physical environment in which learning would take place. An effort would be made to ensure continuity, sequence, integration and timeliness in the organization of the learning experiences.

Evaluation is inherent in the curriculum development process, and since the purpose of evaluation is to see how far objectives are actually being realized, it would begin with the actual stating of the objectives. Two other evaluations would be made - one at the end of the program to measure changes that have taken place, and the other sometime after the teaching has been completed to assess permanence of behavioral change. The results of the evaluation would be used to identify inadequacies in the curriculum and make necessary improvements.

With regard to the conditions that currently exist in Guyana this curriculum could be implemented at the Guyana School of Agriculture where the staff and other facilities used for the pre-service training programs could be utilized for the in-service training program. There might also be value in having several kinds and levels of training in the same institution concurrently. This type of interaction not only would serve to eliminate status barriers among Agriculture Field Assistants to communicate, but also provide different perspectives to the same problems.

The Guyana School of Agriculture should continue to provide pre-service training of Agriculture Field Assistants. However, with the integration of this curriculum, it will need to modify its existing programs - to make them more <u>diverse</u> in terms of courses offered concurrently, and also, more <u>continuous</u> with training planned over a long period of time.

Instead of providing terminal diploma and certificate programs, it will need to redesign its programs for continuing education with regards to on-the-job training of the districts and in-service training at the Guyana School of Agriculture.

CHAPTER I

THE PROBLEM AND ITS SETTING

THE PROBLEM

Guyana is now a politically independent country having gained its independence from the British on May 26th, 1966 after 163 years of colonial rule. However, for independence to be truly meaningful there has to be a greater degree of economic independence than now exists in the country.

The economy of Guyana is clearly dependent upon agriculture, and, to increase its economic independence, the country needs to accelerate its rate of agricultural development. In planning for agricultural development, there are, according to Mosher(67),four functional components that need to be considered. The first of these is farming and the farm business. The second is the commercial agri-support activities which include farm inputs, marketing, and production credit for farmers. The third component is non-commercial agri-support activities which include research, extension and training of agricultural technicians. The last component is the agri-milieu which encompasses the political, economic and cultural environment in which agricultural development is to take place.

The four components in this typology are inter-related, and, to bring about desired changes in the first component, which is agriculture, there need to be planned changes in the other three components. This

approach to development is referred to as the integrated approach.(67)

The problem in this study is how to develop a need-oriented, pragmatic curriculum for training Extension personnel in Guyana to effectively perform their roles as promoters of change.

THE SETTING OF THE PROBLEM

Geography

Guyana is an equatorial country with an area of 83,000 square miles, situated on the north-east shoulder of South America between latitudes two and eight degrees north and longitudes 56 and 61 degrees west. It is bounded by the Atlantic Ocean on the north, Brazil on the South, Venezuela on the west and Surinam on the east.

The country is traversed by many large rivers with numerous tributaries and streams. Ecologically, it can be divided into three main belts:

(a) The Coastal Belt which is a flat narrow plain that runs parallel to the Atlantic Ocean. This area is below sea level and has to be protected against high tides by expensively built sea defenses. Inland, the land rises to about 12 feet above the high water mark. The soil is of a rich marine alluvium with large areas of peat soils inland. This belt is the most developed area of the country. It occupies less than ten per cent of the area of the country, but contains more than 90 per cent of the population and almost all the major agricultural cultivations.

(b) The Sand and Clay Belt, which lies behind the Coastal Belt, occupies 83 per cent of the country and is covered with dense equatorial forests except for the Ripununi and Ebini savannahs. The forests are uninhabited except for a few Amerindian settlements along the river

banks and scattered mining and timber operations. The grasslands are used for ranching.

(c) The Mountainous Region to the west is an undulating plateau rising successively at various distances from 1200 feet to 4000 feet high and culminating at the flat-topped Mount Rorima, a plateau 40 square miles in area which rises 9000 feet above sea level. This area is undeveloped, but it has great potential for tourism because of the Kaiteur Falls. (See Figure I for map of natural regions and relief).

Climate

The climate of Guyana is similar to that of most other equatorial coast lands with two wet seasons and two dry seasons. The wet seasons are from April to August, and November to January. The mean annual rainfall along the coast varies from 80 inches in the east to 110 inches in the west and diminishes to 60 inches in the south. The mean monthly temperature is about 70°-80°F. Temperatures above 90°F and below 70°F are seldom experienced and, throughout the year, the temperature and humidity of the coast is tempered by the cool sea breeze.

History and Population

Guyana was discovered by Christopher Columbus in 1498 as he sailed along the South American coast during his last voyage. Little attention, however, was paid to this area until the last decade of the 16th century when Sir Walter Raleigh came in search of the mythical golden city of El Dorado. The first settlements were established by the Dutch in 1621, and with the exception of the three year period 1781-1784 when the colony was temporarily under French occupation, the Dutch governed the country

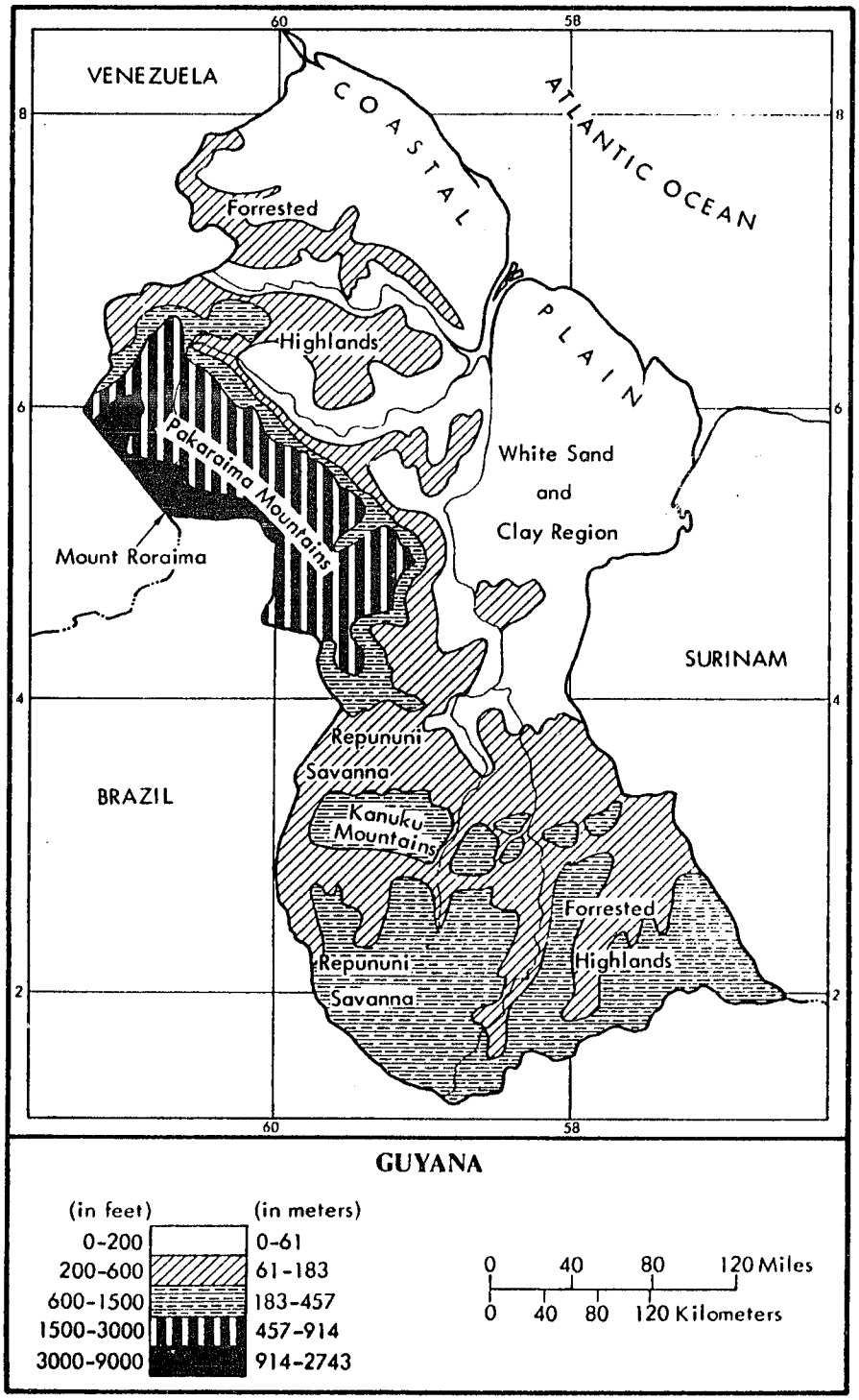


Figure I. Natural Regions and Relief of Guyana

until 1796 when the British seized control. It was returned to Dutch rule in 1802 under the Treaty of Amiens, but the British seized control again a year later, and it remained under British rule until 1966 when it was granted political independence.

The history of Guyana is primarily the story of its ethnically diverse population. Nearly 95 per cent of the people are decendants of immigrants who were brought to the colony during the 19th and early 20th centuries to work on the sugar plantations. The Africans were the first immigrants. They came as slaves and after slavery was abolished in 1833, the slave-trade was replaced by the indentured system which drew first from Portugal and China and then from the Indian Subcontinent.

The population of the country, numbering about 750,000, is composed of people of at least seven definable ethnic groups. The two largest groups, comprising the bulk of the population, are the East Indians (50 per cent) and the Africans (30 per cent). There are small numbers of Portuguese (1 per cent), other Europeans (1 per cent), and Chinese (1 per cent). A mixed group comprises about 12 per cent of the population. Finally, there is a small number of aboriginal people (4 per cent), known in Guyana as Amerindians.

Although the people of Guyana are of different ethnic origins, it is misleading to conclude that each ethnic group is basically different in that the way of life of each ethnic group is similar to that of the country from which their ancestors came. Every new generation seems to be less conscious of its origins and more interested in Guyanese nationalism. In the past there were serious racial conflicts between the two major ethnic groups, but since independence this problem has almost completely disappeared. The people of Guyana is an invaluable resource of development.

Settlement Pattern

The population of Guyana is largely rural. More than 70 per cent of the people live outside the cities in villages, on private estates, on small farms and on land development schemes where their chief occupation is farming.

The villages are situated on the coast along the main roads. They vary in size from one-third to a mile in length, with populations from 200 to 10,000 persons. The houses are concentrated in the "residential area" with the farms at the back. There is often a communal pasture for livestock. Pigs, poultry, sheep, goats, a few cows and a small vegetable garden are often maintained on the site of the farmer's house. The farms are usually fragmented into three or four parcels of land, each in a different section of the farming area. The farming area varies from about one to eight miles in length to a third to one mile in width (that is the width of the village), and is divided into sections across its length. It is claimed that the reason for this division is to share all the advantages and disadvantages of soil types, distance from home and the like equally among the villagers. The ownership of land in the villages is usually free-hold.

The settlement pattern on the private estates is similar to that of the villages particularly with regard to housing and keeping of livestock. However, on the private estates, it is common to find the "tenant-farmer" who rents land on an annual basis from the owner of the estates. The land may be occupied either in parcels in various parts of the estate or in large undivided units.

The owner-operated small farm which varies in size from 10 to 30 acres predominates on the river banks rather than on the coast. The

land may be leased from the Government or occupied with freehold title.

Land settlement schemes are a result of the Government's plans to bring new land under cultivation. Here again the settlement pattern is similar to the villages with homes of the settlers in the "residential area" near the public road and the farms at the back. The area of land given to each tenant for which an annual rent is paid varies from 10 to 20 acres.

AGRICULTURAL SITUATION IN GUYANA

Guyana has a total land and water area of over 53,000,000 acres. Of this area, only about 4,000,000 acres on the Coastal Belt are utilized for agriculture. The rest is occupied by forests (38,000,000 acres), waterways (4,000,000 acres), savannahs (6,000,000 acres), and swamps (1,000,000 acres). The land utilized for agriculture is divided into ranches (2,500,000 acres), sugar plantations (500,000 acres), and small holdings for subsistence farming (2,000,000 acres).

Agriculture organization and operation in Guyana can be classified according to two systems. First there is the subsistence system which is characterized by problems of drainage and irrigation, inefficient water utilization, pests and diseases, market competition and poor soils. This system is labor intensive, and is devoted to rice production, but also includes food crops, coconuts, coffee, cocoa and citrus. Then, there is the commercial system which is devoted to sugar but also includes rice. This system is characterized by heavy capital investments and its major problems are those relating to the competitive world market.

The difference between these two systems of agricultural organization is the extent of production for family consumption or for sale. Those farms at the subsistence end of the continuum from subsistence to commercial, produce mainly for family consumption and therefore have little cash income to invest back on inputs for development. Subsistence farmers are also reluctant to change their methods of production for fear of putting their families' food supply in jeopardy. The problem facing agricultural developers in Guyana is how to move farmers from the subsistence end to the commercial end of the continuum. This is the challenge that confronts the Extension workers.

Agricultural Production

Agriculture is the main support of Guyana's economy providing employment for over a third of the country's population and constituting almost two-thirds of its total exports in 1975. In the same year, agriculture (including agri-industrial products, fisheries and forestry) accounted for almost a quarter of Guyana's national income.

The principal agricultural products are sugar, rice, coconuts, bananas, and ground provisions (edible root crops). Crops of less importance include citrus, coffee, maize and minor tropical fruits and vegetables. Livestock products, most of which go into local consumption, comprise beef, milk, pork, mutton, poultry and eggs. Fisheries and forestry are also important agricultural products.

Sugar - This is the most important commercial crop in the country. It is produced on 13 large sugar plantations which managed 120,800 acres of cane that supplied 11 processing factories in 1975. In the same year, 17,200 acres of cane were grown by small peasant farmers. This was a significant increase in acreage as compared to 1965 when only 99,500 acres

of cane were grown by the large estates and 12,300 acres of cane were grown by the peasant farmers. The increase in production of sugar was also significant with 340,000 tons produced in 1975 as compared to 311,900 tons in 1965. The major problems confronting the sugar industry are world market competition, high production costs, and dissatisfaction of workers caused by techological unemployment.

Rice - This is the second most important commercial crop in the country. Unlike sugar it is grown mainly by small farmers who cultivate two crops of rice per year. In 1975, 282,000 acres of rice were cultivated on the main crop and 108,000 acres were cultivated on the small crop. This represents an increase in total acreage as compared to 1965 when 275,000 acres of rice were cultivated on the main crop and 89,000 acres were cultivated on the small crop. Also, there has been an increase in production of rice during this period. In 1975, 187,559 tons of rice was produced as compared to only 164,889 tons in 1965.

Although the aggregate output of rice has increased, the average productivity per acre has fallen. The major problems facing the industry are to increase per-acre yield of rice, to reduce production costs through better cultivation techniques, to grow more of the best-selling, long-grain varieties, and improve milling standards.

Other Agricultural Products

Other agricultural crops include coffee and cocoa which constitute small but important export commodities in Guyana. Tropical fruits and vegetables which are grown, but are not exported in significant amounts at present are coconuts and bananas for which the production has been steadily decreasing over the last decade because of disease problems.

Livestock production (including cattle, poultry, pigs, sheep and

goats) contributed almost the same share to the Gross Domestic Product in 1974 as did other agricultural products. Cattle and pig production remained almost steady over the period 1965 to 1975, but the production of sheep and goats decreased almost 50 per cent during the same period. Poultry production has increased from 2,104,000 pounds in 1965 to 12,500,000 pounds in 1975 and the production of eggs more than doubled during this same period. The meat industry seems to have considerable growth potential depending on the solution of such problems as poor transportation, inefficient cold storage facilities, high feed costs, high labor costs, and pests and diseases.

Fishing and shrimping have been a growing industry in Guyana, chiefly based upon the ready market for frozen shrimp in the United States. The production of frozen fish has increased from 17,800,000 pounds in 1965 to 38,581,000 pounds in 1975 and the production of frozen shrimp has increased from 8,000,000 pounds to 13,486,000 pounds during this same period.

The production of Guyana's timber which are mostly hardwoods, used for local construction as well as for export, has remained relatively steady over the last ten years. There is no reforestation program however, and many of the species have become scarce because of heavy extractions near the rivers, and difficult access to rain forests.

Agricultural Development

Guyana has the soils and climatic conditions that are ideally suited for the production of most tropical crops and livestock. However, only about one-tenth of its total land area is under cultivation, and the majority of its rural population are employed only seasonally. With these

resources available, Guyana has the potential to develop a dynamic agriculture that will not only make it self-sufficient in food and fibre, but also be able to produce considerable quantities for export.

The economy of Guyana is heavily dependent upon sugar and rice. In recent years however, these commodities have been facing severe competition in the world market. Also, over the last decade, Guyana has continued to import over a fifth of its food requirements. There is immediate need for the country to diversify its agriculture to produce substitutes for imported food commodities, stabilize its economy, and provide year-round employment for its rural population. Also, there is need to increase its present level of agricultural production to produce enough food and fibre to meet the demands of its rapidly growing population, as well as, that of the export markets.

The goals of the 1977-1980 Agriculture Development Plan can be stated as follows:

(1) To increase the production of food commodities in which the country is already self sufficient such as fish, meat, ground provisions and vegetables.

(2) To double the production of rice.

(3) To increase the production of sugar by at least 20 per cent.

(4) To produce enough corn and legumes such as black-eye peas to make the country self sufficient in these commodities.

(5) To make the country self sufficient in cotton textiles and leather goods.

(6) To make the country self sufficient in milk and dairy products.

(7) To make the country self sufficient in vegetable oils through the cultivation of soya bean, African oil palm, improvement in

the coconut industry, and extraction of oil from rice bran and cotton seed.

(8) To increase the exports of sugar, rice and shrimp and start an export trade in processed fish, poultry meat, pork and pork products, ground provisions, legumes, vegetable oil, corn and soya bean.

The Agriculture Development Plan used to attain the goals outlined above needs to take many factors into consideration. Mosher(67) summarized these factors under four headings: agriculture, commercial agri-support activities, non-commercial agri-support activities and the agri-milieu.(67)

Agriculture: Associated with farming and farm businesses the following strategies are included in the Plan to attain the above objectives:

(1) Establishment of state farms in the hinterland areas where selected farmers can concentrate on the production of commodities that are different from those produced on the coast.

(2) Cultivation of 2,000 acres of oil palm in the North West District and 15,000 acres of soya beans in the Intermediate Savannahs.

(3) Cultivation of an additional 5,000 acres of corn and 3,000 acres of peanuts in the riverain areas.

(4) Improvement of land settlement schemes on the coast by providing better roads, drainage and irrigation facilities and the like.

(5) Expansion of acreages under cultivation of sugar and rice by 33,000 and 55,000 acres respectively.

(6) Development of 15 ranches on the coastal plain and 10 in the Rupununi to increase the production of beef by 320,000 pounds.

(7) Improvement of existing dairy cattle through the provision of artificial insemination service and eventual sale of the dairy animals being imported.

(8) Improvement of the pig industry through the feed credit scheme and better nutrition, housing and management.

(9) Improvement of the poultry industry through the provision of cheap high quality feed.

(10) Establishment of facilities for processing and storage of agricultural commodities.

Commerical Agri-Support Activities

Necessary services which are included in the Development Plan, but for which the farmers have to pay are:

(1) Adequate financing of farmers through the Guyana Agricultural Cooperative Development Bank.

(2) Pre-arranged markets for the farmers' produce.

(3) Duty-free importation of agricultural machinery.

(4) Provision of necessities for farming such as improved breeding stock and planting material and the like.

(5) Incentive financing by the Ministry of Agriculture.

Non-Commercial Agri-Support Activities

Necessary services to the farmers for which they do not have to pay include:

(1) Improving the efficiency of agricultural research by encouraging the multi-disciplinary approach.

(2) Enlarging the scope of research to include all aspects of agriculture - agronomy, veterinary and animal production, fishery marketing, extension and economic matters.

(3) Enlarging the staff and improving the efficiency of the Extension Service to serve a larger body of clientele and embrace a wider

range of educational programs. New programs would include marketing and preservation of agricultural products.

(4) Expanding the pre-service training program for Agriculture Field Assistants by awarding scholarships and encouraging more students to attend the Guyana School of Agriculture.

(5) Establishing a regular in-service training program of Agriculture Field Assistants to ensure that they will always have an adequate number of well trained personnel.

(6) Establishing a degree program in General Agriculture at the University of Guyana.

Agricultural Milieu

Political Framework - Guyana became an independent nation, within the British Commonwealth, on May 26, 1966 after 163 years as a British colony. A constitution, following British political norms and ideals was instituted on that same date, although years of debate had gone into its preparation in the period prior to independence. The constitution makes provision for the governing of Guyana as a democratic society founded upon the rule of law.

The country is ruled by a coalition government formed by the two smaller parties of a three party system. The Prime Minister, Forbes Burnham who leads the Poeples' National Congress, is an eclectic socialist, but has followed moderate policies since 1964 when he joined in coalition with the conservative United Force party to form the government. The Peoples' Progressive Party, led by Dr. Cheddi Jagan, who was alleged to be a communist, dominated in the 1950's and early 1960's.

British influence predominates in political structure and in practices of government. English common law has been the chief legal influence for over a century, although vestiges of Roman-Dutch law linger on, particularly in matters concerning land tenure. The political leaders are, for the most part, educated in England, the United States or the British Caribbean, and the great majority have accepted British norms of political behavior.

Economic Framework

Guyana's economy is considered to be underdeveloped, but it has considerable potential for growth. National resources are abundant, and the vast interior of the country offers plenty of room for expansion away from the narrow coastal plain upon which 90 per cent of the population is crowded. Built around the production of sugar and rice, the economy is slowly diversifying, but agriculture continues to be the most important sector and supports 75 per cent of the population, which reached 750,000 in 1975 and is rapidly growing, thus putting increased pressure on the economy to provide employment.

As part of the colonial legacy, the entire economy of Guyana is almost wholly oriented around the export trade. Guyana is a producer of primary products (crude sugar, rice and aluminum ore) for the export market and must import nearly 20 per cent of its food stuffs and most of its manufactured consumer and capital goods.

Guyana has abundant natural resources, but she lacks both the finance and economic substructure to successfully exploit them for development. All forms of surface transportation (roads, rivers, railways, and aircrafts) taken together are inadequate to meet development needs. Supply

of gasoline and diesel fuels are expensive and sometimes have to be rationed. Electricity supply is adequate to meet the needs of those areas that are presently being served, but inadequate for large scale industrial expansion. Communication is slow and inefficient especially in the remote rural areas. There is no television. The two radio transmitters are located in Georgetown, and the three major newspapers are circulated only in the heavily populated areas. Telephone and telegraph services are very limited. Unemployment is increasing and there is need to exploit the human and natural resources available for development.

The major targets of the 1976-1980 development plan include: provision of employment for all workers; increasing of productivity; completion of existing land development projects and the undertaking of new drainage and irrigation projects; promotion of agricultural and industrial diversification; the making of detailed surveys of the entire country to determine resource potentials; improvement of roads, transport facilities, and port facilities; expansion of the educational system; improvement of health services; fostering of cooperative movements; and provision of potable water and electricity in the rural areas.

Cultural Framework

More than 90 per cent of the people of Guyana are descendants of immigrants who came to the country either as slaves or as indentured laborers to work on the sugar plantations. The population of the country, therefore, is composed of people of at least six different cultural backgrounds: Africans, East Indians, Portuguese, Chinese, Europeans and Amerindians. The result is that Guyanaese culture is a mixture of the

immigrant cultures.

A significant feature of Guyanese culture is the dominance of British social values. The reason for this is that behavior patterns conforming to British expectations were compulsory for the slaves and later for the indentured laborers. One area in which plantation management was permissive was limited tolerance of East Indian religious life. The result is that the East Indians are the only ethnic group who have served under the plantation system and yet retained some of their original cultural values. The Amerindians who were free of plantation control, and less forcefully pressed by the colonial government, have also retained much of their cultural values.

The colonial education and religious institutions were less influential than the plantations in impressing colonial values. More than 80 per cent of the people in Guyana today are literate, at least up to the elementary school level.

Education is now the responsibility of the Ministry of Education and Culture which emphasizes the development of a Guyanese identity and does not interfere with the religious persuasion of the people. The three major religions in Guyana are Christianity, Hinduism, and Islam.

The relationship of the people to agriculture seems to conform to their cultural backgrounds. The East Indians are particularly adaptive to subsistence agriculture because of their joint family system and the need for family labor in this type of endeavor. The Africans seem to prefer to work for wages in commercial agriculture and will only engage in subsistence agriculture when they cannot find work elsewhere. The British, Chinese and Portuguese make up the commercial class. The Amerindians still live on the reservations but plans are being made to assimilate them into the Guyanese society.

THE EXTENSION SERVICE

Organization

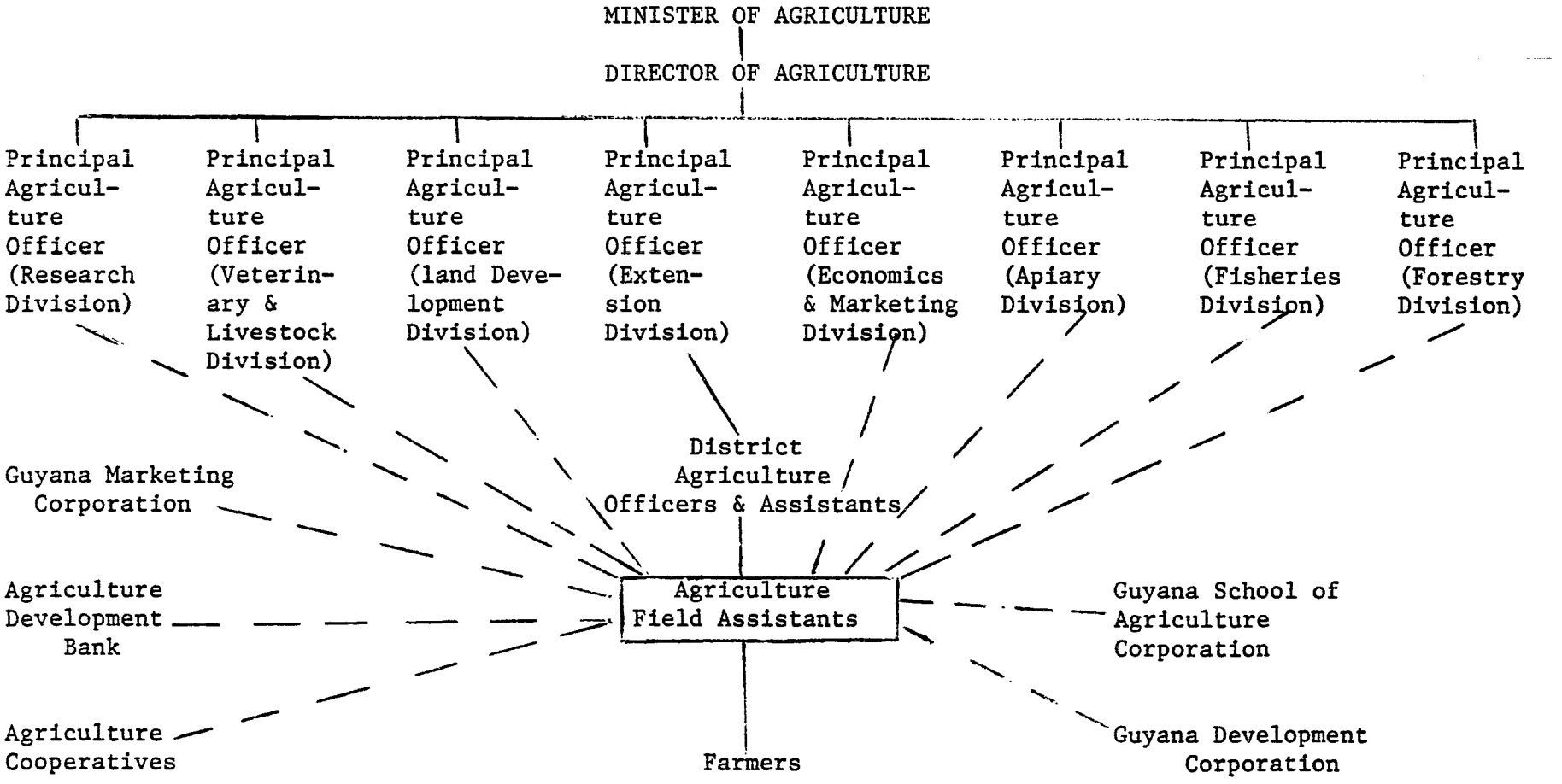
Advisory work in agriculture was first started in the colony of British Guiana as early as 1846 by the Royal Agricultural Society. The Department of Science and Agriculture was established in 1905 and a small number of Agriculture Officers were appointed to the various farming districts to advise and assist farmers to perform services relating to agriculture. The Extension Service as it is known today was organized in 1927 when demonstration stations were established in the various districts and the Extension staff was increased. It was reorganized in 1952 when it was made a Division of the Ministry of Agriculture and a senior Agriculture Officer was appointed to manage the Division.

Extension is a Division of the Ministry of Agriculture which is made up of seven other Divisions - Research, Veterinary and Livestock, Land Development, Economics and Marketing, Dairy, Fisheries, and Forestry. All eight Divisions of the Ministry of Agriculture work very closely with each other in helping to promote agricultural development. At the head of each Division is a senior Agriculture Officer who is responsible directly to the Principal Agriculture Officer.

The Extension Division is organized into 11 Agricultural Districts which are further sub-divided into 64 Sub-Districts. Agriculture Officers are incharge of the districts, and Agriculture Field Assistants are incharge of the sub-districts. The Agriculture Assistants are usually in charge of the Demonstration Stations. (See Figure II for Organizational Chart and relationship with other agri-support agencies.)

Figure II

ORGANIZATIONAL CHART OF THE EXTENSION SERVICE AND ITS RELATIONSHIP WITH VARIOUS AGRI-SUPPORT AGENCIES.



Objectives

The objectives of Extension both stated and inferred can be listed as follows:

1. To conduct informal educational programs for farmers and their families with the hope that they will raise their production levels, increase their economic efficiency, and improve their standards of living.
2. To advise farmers on how to obtain necessary assistance from the various commercial and non-commercial agri-support agencies.
3. To assist farmers in obtaining such necessities as planting materials, breeding stock, fertilizers and the like.
4. To assist farmers with necessary services such as first aid treatment to a sick or injured animal, control of various crop diseases and the like.
5. To help implement Government plans and perform various regulatory functions for the Ministry of Agriculture.
6. To represent the Ministry of Agriculture and cooperate with the other commercial and non-commercial agencies in performing their functions.

Personnel Training

Extension workers are educators. Their major function is to assist people to make changes in their behavior patterns. It is philosophically important, therefore, that Extension personnel be provided with the necessary training to perform this role.

Pre-service training is provided at the Guyana School of Agriculture. This is a vocational college that was founded in 1963 as a Division of the

Ministry of Agriculture, but was later converted into a Public Corporation. The staff of the Guyana School of Agriculture includes ten full-time lecturers and a number of part-time lecturers from the Ministry of Agriculture and related Government organizations. It provides the following training programs:

1. A two-year diploma course in General Agriculture for graduates of secondary schools. This program is designed to produce Agriculture Field Assistants for the Extension Service and other Divisions of the Ministry of Agriculture.
2. A two-year certificate course essentially of a practical nature in General Agriculture for graduates of elementary schools. This program is designed to equip young people for farming careers, but because of shortage in staff, many of these graduates have been employed as Agriculture Field Assistants by the Extension Service.
3. A one-year in-service diploma course in Vocational Agriculture Education for practicing teachers who have already been professionally trained.
4. Short courses in specialized subjects, such as livestock and vegetable crops, for farmers with the aim of helping them to acquire necessary farming skills.

The pre-service training in General Agriculture provided to both the diploma and certificate graduates of the Guyana School of Agriculture perpares them for the technical aspects of their job with the Extension Service. This type of training might be considered adequate for them if they are to function only as agricultural advisors as was the case in the past. However, if they are to adopt the modern educational approach to

Extension, they need to understand and be able to apply in their work relevant concepts in Extension Education and related Social Science disciplines.

The idea of in-service training for Extension personnel is not new. They have been provided with in-service training before in the form of seminars and workshops locally, and short courses abroad. However, most of these in-service training programs were concentrated on the technical areas of the Extension worker's job. This curriculum, therefore, will concentrate on the educational aspects.

The Guyana School of Agriculture is currently offering in-service training in Vocational Agriculture Education for practicing teachers. With a modest increase in staff and facilities it can also arrange to provide in-service training in Extension Education for practicing Extension workers. The difference between the situations of the teachers and the Extension workers is that the latter do not have the long summer holdiays to attend full-time classes; therefore, it will be necessary to arrange to offer training within the Agriculture Districts so that they can attend classes in the evenings. In-service training will not only benefit the Extension workers, but it will also help to improve the quality of teaching at the Guyana School of Agriculture, because it will provide the lectures with the necessary "feed-back" of what is going on in the field, and they can then plan their program to better meet the needs of their students.

PURPOSE OF THE STUDY

Pre-service training in General Agriculture prepares Extension personnel in Guyana for the technical aspects of their job. However, if

they are to function effectively as Extension educators in the field, they also need to understand and be able to apply concepts relating to Extension Education. The purpose of this study therefore, is to develop a need-oriented, pragmatic curriculum in Extension Education that will supplement the technical agriculture curriculum that is currently being used at the Guyana School of Agriculture for pre-service training of Extension workers.

Specific Objectives of the Study

The following are specific objectives of the study designed to realize the overall purpose:

1. To develop a personal profile of Agriculture Field Assistants based on their age, sex, educational background, experience and organizational affiliation.
2. To develop a job profile of Agriculture Field Assistants characterized by job tasks assigned and performed, and areas of specialization.
3. To select and screen a set of concepts as to their Extension work importance.
4. To review literature pertaining to the Agri-milieu in Guyana.
5. To analyze data and infer educational objectives for an in-service training curriculum for Agriculture Field Assistants.
6. To design a curriculum based on the Tyler model to develop knowledge, comprehension, and application levels of cognitive abilities, as well as, positive affective abilities in the Agriculture Field Assistants.
7. To suggest a training package to achieve the curriculum objectives.

Assumptions of the Study

The assumptions that have to be made with regard to this study are:

1. Agricultural planners in Guyana are conscious of the educational approach to Extension and will therefore be willing to consider this curriculum for in-service training of Extension personnel.
2. The political, economic and social conditions in Guyana will stabilize and improve over the next several years so that a favorable climate for educational changes in the Extension Service pervades.

Limitations of the Study

This curriculum is designed to facilitate Extension workers in Guyana to develop knowledge, comprehension and application levels of cognitive ability of selected concepts in Extension Education and related social science disciplines. The three higher levels of cognitive ability described in Bloom's heirarchy of cognitive objectives will be left for other studies that will develop educational objectives for more educationally advanced students. Also objectives designed to develop psychomotor skills with regards to teaching are outside the scope of the study.

DEFINITIONS OF TERMS

Agriculture Field Assistants are front line Extension workers who plan and execute Extension programs at the sub-district or village level and farm level. Their minimum qualification is supposed to be a diploma in General Agriculture. However, in recent years many certificate graduates from the Guyana School of Agriculture have been employed as Agriculture

Field Assistants. They can be classified either as Grade I or Grade II depending upon their length of service. Agriculture Field Assistants with specialized training in livestock husbandry are referred to as Livestock Assistants.

Agriculture Assistants are Agriculture Field Assistants who have been promoted because of length of service. They are usually in charge of Demonstration Stations, but they also perform Extension functions and assist the Agriculture Field Assistants in planning and developing their programs.

Agriculture Officers are university graduates in agriculture or some related field. Their duties involve planning and supervision of Extension and Research at the District level. They are also responsible to carry out agriculture investigations and represent the Department of Agriculture generally.

Agriculture Lecturers are university graduates who lecture in various aspects of agriculture at the Guyana School of Agriculture.

Extension Service which is sometimes referred to as the Extension Division is the educational arm of the Ministry of Agriculture.

Agriculture District - The country is divided into 11 Agriculture Districts and each District is divided into Sub-districts. There are 64 Sub-Districts.

CHAPTER II

THEORETICAL FRAMEWORK

Learning Theory

The concept education is derived from the Latin verb "duceo" which means to lead. An educator, therefore, is a leader and his teaching role involves leading people to realize their needs and interests through the creation of suitable learning situations and the provision of appropriate learning experiences. This is a very delicate and complex social process for it involves changing the ways people think and act and this determines the nature of society. The question is: can teaching be learned? According to Leagans:

> The ability of individuals engaged in teaching varies, but so it does among those in other professions. There are no born teachers any more than there are born lawyers, or doctors, or engineers, or farmers, or carpenters. Everyone is gifted by nature. Anyone with good intelligence and the will to study, practice, plan and revise ways of doing the job can gain the skill to do effective teaching. Hence, there is no mystery about learning how to be a good teacher. It is simply a matter of hard work, practice, concentration and the will to achieve proficiency. This is the price one must pay for acquiring real skill in any profession(60).

Whilst teaching can be viewed as a process, learning can be viewed as the product. Learning is defined by Cohen as "changed capabilities for, or tendency toward acting in particular ways. It is a retainable quality, not one ascribable to temporary states of mind caused by drugs or fatigue. Nor is it change that occurs as a result of normal growth or maturation"(8). Lindgren(24) states that a person who is actively engaged in the process of learning is a person who is moving toward attaining intellectual, social,

and emotional maturity, Verner(81) states that learning is the aquisition of information and the mastery of intellectual behavior through which facts, ideas, or concepts are manipulated, related and made available for use. Mosher(68) pointed out that learning needs to be a life-long activity.

The kind of change called learning exhibits itself as a change in behavior. That learning has taken place is inferred by comparing what behavior was possible before the individual was placed in a "learning situation" and what behavior can be exhibited after such treatment.

Learning may occur under two general types of settings: the natural societal setting or the formal instructional setting. Under both types of settings, learning takes place through the experiences which the learner has: that is, through the reactions he makes to the conditions in the environment in which he is placed.

Educational Objectives

Cohen(8) states that an educational objective is a specific, observable student action or product of student action. To satisfy this definition the objective must first specify something that student is to do; second, state the circumstances under which he will do it; and, third, note the degree of accuracy with which he will perform the action.

Klausmeier and Goodwin(21) identified three ways in which educational objectives may be stated:

(a) as broad areas of curriculum content.

(b) as outcomes of learning or "behavior changes".

(c) as development of human abilities.

Bloom(4) and Krathwohl, Bloom and Masia(22) suggested the classification of educational objectives according to the type of behavioral outcomes

expected. Cognitive objectives are those which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills. Affective objectives are those which describe changes in interest, attitudes, and values, and the development of appreciations and adequate adjustment. Psychomotor objectives are those which deal with the manipulative or motor-skill area.

Cognitive Objectives

Guilford(50) proposed a three-dimensional model for analyzing cognitive learning. Cognitive ability can be viewed as a combination of three dimensions: the intellectual operations or activities on the part of the individual, the content or classes of information to which the individual is exposed and the products of thinking that take place within the individuals. The outcome of these interactions is improved higher-level cognitive ability. The intellectual activities progress in complexity from cognition through memory, divergent production and convergent production to the level of evaluation. These processes parallel the heirarchical framework suggested by Bloom(4),wherein knowledge is the simplest cognitive process, followed in increasing difficulty or complexity by comprehension, application, analysis, synthesis and evaluation.

Woodruff(38) and Gagne(15) have also indicated the hierarchical nature of cognitive learning processes. At the base of cognitive learning, Woodruff identifies subconscious, spontaneous conceptualization from perceptual experience, which is similar to the stimulus-response, chaining and verbal association learnings of Gagne. At the higher levels, Woodruff recognized thinking and application as inductive learning processes and analysis and creation as deductive in nature. Gagne's pyramid of learning

processes move through multiple-discrimination learning, concept learning, principle learning and problem-solving ability.

In Bloom's taxonomy of cognitive objectives(4), knowledge implies "the recall of specifies and universals... methods and processes, or... a pattern, structure or setting... knowledge objectives emphasize most the psychological processes of remembering..." The National Society of the Study of Education(69) devoted its 1946 yearbook to the measurement of understanding as opposed to rote memory. Understanding was operationally treated as any behavior from stating a proposition in words different from those of the orignial statement, through giving examples of a referent in a definition, to applying a principle in a situation new to the learner. Bloom classified the operations of understanding into five levels of intellectual skills and abilities.

Comprehension represents the lowest level of understanding. It implies the ability to translate, interpret and extrapolate from messages which are received as input and indicates a step beyond the verbalization of knowledge. The individual, according to Ebel(11), has, to some extent, a "command of substantive knowledge".

Application involves "the use of abstractions in particular and concrete situations. The abstractions may be... general ideas, rules of procedures or general methods... also technical principles, ideas and theories which must be remembered and applied"(5, p. 205). The individual acquires an intellectual independence and is able to cope with new problems and situations. The ability to apply implies behaviors such as being able to:

1. Determine which principles or generalizations are relevant or appropriate.

2. Explain new phenomena.

3. Predict what will happen.

4. Determine or justify a particular course of action or decision.

Analysis implies the breakdown of a communication into its constituent elements or parts such that the relative heirarchy of ideas is made clear and/or the relations between the ideas expressed are made more explicit. Bloom(4) indicates three behavioral dimensions of this ability to analyze-analysis or identification of elements, analysis of relationships or the connections and interactions between elements, and analysis of organization principles which make and hold the communication together as a unit.

The process of putting together the elements or parts to form a whole is known as synthesis. This ability may be expressed when a unique communication or plan is produced or when abstract relations or propositions are developed.

Evaluation is defined as the making of judgements, quantitative or qualitative, about the value of materials and methods for given purposes. It involves the use of standards for appraisal and of criteria which may be determined by the individual or which are given to him. While the ability to evaluate is dependent on the individual's acquisition of prior types of learning, it includes in addition specific behavior involving judgement and evaluation.

Affective Objectives

In the taxonomy of affective objectives by Krathwohl, Bloom and Masia(22), Receiving or Attending refers to the willingness to attend to particular situations or phenomena-learning tasks, textbooks, etc. Learning outcomes in this area range from the simple awareness that a

thing exists to selective attention on the part of the learner. It is the lowest level of learning outcomes in the affective objectives.

Responding represents an active participation on the part of the learner. The learner not only attends to a particular phenomena, but also reacts to it. He is commiting himself in some way to the phenomena. Learning outcomes in this area range from acquiescence in responding to willingness to respond and to satisfaction in responding. In this regard, the higher levels of objectives include the behaviors that focus on voluntary exploring and enjoyment of particular learning activities.

Valuing is concerned with the value or worth in the mind of the learner of a particular thing or phenomenon. It ranges in degree from the simpler acceptance of a value to the more complex level of commitment. Valuing being based on the internalized or accepted values is seen as an individual having value expressed in certain manner such as appreciation.

Organization deals with the assembling of different values into a value system, determining the relationship among them, and establishing them in terms of dominant and pervasive values. It is built gradually and subject to change as new values are incorporated. The emphasis is on comparing, relating, and synthesizing values. Learning outcomes for this system may be extended from the conceptualization of a value to the organization of a value system of an individual.

Characterization by a Value Complex is the level that an individual has a value system. This value system has controlled his behavior for sufficient time to have him develop a characteristic life style. The behavior is thus pervasive, consistent and predictable.

Cognitive - Affective Relationships

In developing a curriculum, it should always be remembered that the classification of educational objectives into cognitive and affective domains is for analytical purposes only, and is quite arbitrary. Many of the objectives which are classified in the cognitive domain have an affective component that could concurrently be classified in the affective domain although this component might not be explicitly stated. In fact, much of what is referred to as "good teaching" is the teacher's ability to lead students to attain affective objectives through the pursuit of cognitive behavioral outcomes. For example, in learning to apply concepts and principles to solve problems in mathematics the teacher hopes the students will develop an interest in the subject. It is also possible to attain cognitive objectives through the pursuit of affective goals, but the cognitive to affective is the more common route. Also, it should always be remembered the emphasis on very high mastery of one domain may in some instances be gained at the expense of the other. New courses should start with a careful analysis of both cognitive and affective objectives.(22)

Concept Learning

A concept is a combination of the symbols, value and meaning, which is individually and/or commonly associated with recorded experiences. Woodruff states:

> The human mind is the depository for all our experience. It has a way of storing experience, something like a motion picture record. This stored record makes possible the recollection of past experience almost as if it were happening again. The record is a concept and is a composite of meaning or understanding, feeling and the value and preference it produces and the symbols or language related to them. (38,p.68)

Concepts are essentially non-linguistic because they are classes of experience which the individual comes to recognize as such, whether or not he is prompted or directed by symbolic language phenomena. Because the experience of individuals tend in many respects to be similar, their concepts are also similar, and through various processes of learning and socialization these concepts come to be associated with words. The "meanings" of words are the socially-standardized concepts with which they are associated(7).

Value of Concept Learning

Learning theorists and educationists agree upon the value of concept learning in promoting learning effectiveness and practical application and utilization of knowledge. Gagne(15) emphasizes that the acquisition of concepts in the concept learning process is what makes instruction possible and enables people to think and communicate with one another in a "common language". The individual is freed from the physical environment and is able to abstract ideas and link concepts into meaningful principles which are used in problem solving. Klausmeier and Goodwin(21) state that the retention and transfer of information may be more effective when the learner participates in discovering the nature of the concept and its applications. Contrasting the use of generalizations with the use of concepts in structuring social studies in secondary school, Fenton states:

> Lists of concepts form a more useful notion of structure than lists of generalizations. Let us suppose, for example, that a student knows four concepts from sociology - class, status, role and norms - and wants to analyze the society of Boston in 1750...with them in mind he will search for evidence about class structure... He will try to find out what roles members of each social class played... which roles had high status and which ones ranked at the botton of the prestige scale. Finally, he will seek evidence about the norms -

> patterns of behavior - were expected from everyone. The concepts are "imposed conceptions" which guide the search for data toward issues which sociologists have found useful for the analysis of society(12, p. 14).

Concern has been expressed for conceptual orientation to learning in professional educational circles. According to Tyler(95) the professional person has to be helped to build concepts that are useful in guiding his own thinking about any process or content area. He emphasizes that there is much greater permanence of the usefulness of concepts than there is the particular facts. In discussing the kind of professional education that needs to be practiced, Tyler states:

> The conceptualization of learning as simply acquiring specific habits isn't adequate...we need a concept of education adequate for a person to carry on a job which will be changing all the time and where we cannot predict what the nature will be, but for which we help him acquire some of the tools to think about and to examine the job. As he uses those he will come to the point of being able to modify these concepts as he moves along in the light of new knowledge and ...new experience(95, p. 3).

In a similar vein, Carter(86) refers to orienting learning around the idea of concepts, which are open-ended. These concepts become tools for adding on details and experiences, so that they are continually refined and developed and become increasingly useful.

Process of Concept Learning

Woodruff(38) recognizes five stages in the process of conceptual learning:

1. Perception. Perceptual experiences are founded.
2. Conceptualization. Accumulating perceptual experiences grow into concepts.
3. Thinking. Each new mental picture of something is checked against the pictures already in mind and worked into them or subsumed.

4. Evaluation. Mental pictures of things involved in a decision or line of action are drawn upon to determine,choice.
5. Choosing. Those things are done which bring about the desired results.

The essential characteristic of concept learning is the type of response that the individual makes to things or events. In concept learning, the individual progressively classifies stimuli or perceptual experiences into simple, general concepts, then to larger generalizations, and finally as a comprehensive generalized concept. Through this type of learning, Gagne states that the individual can generalize or extrapolate the learned concept to other different stimulus situations that have not played a part in the learning itself(15).

Curriculum Theory

The concept curriculum is technically comparable to the term program in educational parlance, and at the adult level may be defined as a series of learning experiences designed to achieve certain specific instructional objectives in a specified period of time(38).

The problem of curriculum development is not new to educators in the United States. The 1926 yearbook of the National Society for the Study of Education, The Foundations and Techniques of Curriculum Construction (70) was concerned with the existing problems, the aims of education and the objectives of school.

Some of the important curriculum questions of the past were:

1. In what way does knowledge of learners or subject matter or society contribute to curriculum construction?
2. What is the potential contribution of an educational philosophy to curriculum construction?

3. What is the potential contribution of a psychology of learning to curriculum construction?
4. How do patterns of curriculum organization affect the process of instruction?

In 1950, Tyler(79) suggested a rationale for curriculum development based on four fundamental questions:

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained?

More recently, in 1963, Leagans in Guides to Extension Teaching in Developing Countries(61), gave these four suggestions for improving Extension teaching.

1. Extension teaching requires specific and clearly defined objectives.
2. Extension teaching must accomplish certain kinds of educational changes in relation to the subject matter taught. Among these are: changes in knowledge, skill, attitude, interest and understanding.
3. Extension teaching usually requires a combination of teaching methods.
4. Extension teaching requires careful evaluation of results.

With regard to the selection of learning experiences, Leagans also cited five suggestions to be considered by Extension workers in developing their programs.

1. Learning experiences must be satisfying to the learner when he carries them out.

2. The reactions desired in the learning experience should be within the ability, both mental and physical, of the learner.
3. Many learning experiences can be used to attain the same objective.
4. A single learning experience will usually contribute to the attainment of more than one objective.
5. Learning experiences must be such that the Extension worker can provide them effectively.

The Tyler rationale for curriculum development involves a series of interrelated steps. It starts with the selection of educational ojbectives which Tyler defines as the kinds of changes in behavior of people which the educational institution tries to bring about. The objectives then become the criteria by which materials are selected, content is outlined, instructional procedures are developed and examinations are prepared.

Selection of Educational Objectives

Tyler suggests three sources of information to be used in the selection of educational objectives: the learners themselves, contemporary life, and subject-matter specialists. A study of the learner is important in order to determine their needs and interests, and what aspects of their behavior needs to be changed. Contemporary life as a source of educational objectives enables the educator to select knowledge, skills and values that are currently important for the students to learn. Furthermore, educational objectives inferred from comtemporary life enables the students to easily relate what is learnt in school to problems outside the school. Finally, suggestions from specialists are important as a source of educational objectives because they are familiar with their field and they ought to know what contribution their subject can make to their particular

field, as well as, to other educational functions that may not be thought of as the unique functions of the subject itself.

The number of objectives derived from the three sources are usually more than can be incorporated in the school's curriculum. Tyler, therefore, suggests screening objectives using the philosophy of educational agency and the psychological learning conditions as screens. This screening process enables the selection of a small number of the most important, consistent objectives that can be attained with the resources available and in the time specified.

Selection and Organization of Learning Experiences

Tyler uses the term learning experience to refer to the type of experience the student has through the reactions he makes to the conditions in the environment in which he is placed. He also explains that it is possible for two students to be in the same class and for them to be having two different experiences depending upon their needs and interests. This implies that it is the responsibility of the teacher to select and organize suitable learning experiences that will evoke desirable interactions between the students and the conditions in the environment in which they are placed.

He suggests the following five principles for selecting learning experiences:

1. For a given objective to be attained, a student must have experiences that give him an opportunity to practice the kind of behavior implied by the objective.
2. Learning experiences must be such that the student obtains satisfaction from carrying on the kind of behavior implied by the objective.

3. Learning experiences should be within the range of possibility for the students involved. That is to say, the experiences should be appropriate to the student's present attainment and predisposition. This is another way of stating the adage that the teacher must begin where the student is.
4. Many learning experiences can be used to attain the same educational objectives.
5. The same learning experience will usually bring about several outcomes.

Organizing Learning Experiences

The process of changing the behavior patterns of people is slow and usually requires the combined effect of more than one learning experience. Tyler therefore suggests these three criteria for organizing selected learning experiences so that they reinforce each other and have a cumulative effect on the behavior of the student:

1. The first criteria is continuity which refers to the vertical reiteration of major curriculum elements. It emphasizes that for effective teaching, repetition, or using different learning experiences over a period of time is necessary.
2. The second criteria is sequence which emphasizes not duplication, but rather higher levels of treatment with each learning experience. Sequence has two aspects. The first is that teaching must begin at the knowledge level of the students. The second element of sequence is that each successive lesson should be more difficult and go into the subject involved more broadly and deeply.
3. The third criteria for organizing learning experiences is integration

which refers to the horizontal relationship of curriculum experiences. Integration has two aspects also, The first is that learning experiences should be so organized that students increasingly get a unified view of the finished product. The second element is that learning experiences should be organized in such a way as to facilitate students to see the applicability of their learning not only to the particular problem at hand but to others of a similar nature.

Sanders$_{(75)}$ in adapting Tyler's rationale for the development of Extension Programs suggests the criteria of timeliness; or presenting information at the time when it has the greatest opportunity to influence action. Extension workers should consider three elements of timeliness: seasonal, procedural and psychological.

Evaluation

Tyler indicates that evaluation is essentially a process of determining the degree to which behavioral changes are actually taking place in students. This involves at least two appraisals - one taking place in the early part of the educational program and the other at some later point so that changes may be measured. However, two appraisals only might not be enough because some of the objectives aimed at may be acquired during an educational program and then be rapidly forgotten. Also, in order to assess permanence of learning it might be necessary to have an appraisal sometime after the teaching activity has been completed.

He also reasoned that since the purpose of evaluation is to see how far objectives are actually being realized the process of evaluation should begin with the stating of the objectives. Clear definition of

objectives in terms of their behavioral and content aspects, provides a concrete guide to the selection and organization of suitable learning experiences, and also serve as the first step in the evaluation procedure. Other steps involve identifying situations which will give students the opportunity to express the types of behavior that are being appraised; determining the means of getting a record of the students' behavior under test situations; deciding on the terms or units to be used to measure the behavior obtained; and finally to determine the objectivity, reliability and validity of the evaluation instruement that is developed.

These five steps indicate the procedures to be followed in developing an evaluation instrument and in making evaluation. The results of evaluation should be used to identify inadequacies in the curriculum and suggest improvements. Evaluation also has a profound enhancing effect on the processes of teaching and learning.

Another educator who has presented a model of the process of curriculum development is Walker(98). He asserts that, in essence, a curriculum project transforms an initially vague, unsystematic but strongly held vision of the educationally desirable into a concrete educational program. This transformation is accomplished first by attaining agreement on a platform - a body of shared beliefs about curriculum. Then using this platform, the project staff develops a plan of work, the completion of which requires discussion, debate, argument or deliberation on crucial issues, and finally the production of curriculum materials. While the Tyler model regards objectives as an essential starting point, without which learning experiences cannot be rationally selected and assessed; Walker's empirical model views objectives as only one means among others for guiding the search for better educational programs. They are not a starting point but a late development of the curriculum maker's platform.

Training

Training of Extension personnel has been a universal concern of many Extension administrators and educators. Hasley(18) indicated that training was a process of helping people and employees to become interested in their work and become more proficient in their jobs. This could be accomplished by acquiring new knowledge, learning new methods or techniques, removal of deficiences from previous training experiences and development of desirable habits and thoughts pertaining to one's job. According to Otto and Glaser(31) training refers to the teaching and learning activities carried on for the primary purpose of helping members of an organization to acquire and apply knowledge, abilities, skills and attitudes needed by that organization to carry out its mission. Lynton and Pareek(25) and Misra(29) refer to training as a process of developing skills, knowledge, attitudes and behavior of the people through instruction, practice, demonstration or other techniques, either on the job or in the classroom. It is primarily concerned with preparing participants for certain types of skills delineated by technology and by the organization in which they work. Training helps the individual to improve his performance and it deals mostly with understanding the skills.

According to Sanders(35) training in Extension was employed as a means of providing learning experiences for the purpose of fitting a worker into the Cooperative Extension Service so that he could competently meet the demands of his job as determined by changing needs of the people. In this perpetually changing and progressing world, training of Extension personnel becomes a constant requirement. This remains true even for countries already possessing an advanced Extension Education system. In the United States, an Extension worker generally has had a minimum of a

Bachelor's degree from an institution of recognized standing, special courses in Extension and related subjects, and high technical ability in a broad field(53). In most developing countries like Guyana, graduates of Agricultural colleges have been employed as Extension agents.

According to Macris(63) training for Extension workers must meet the following requirements.

1. It must be of the highest professional level permitted by the development stage of the country's educational system.
2. It must provide a strong foundation in general science, together with balanced professional courses and practices in farm and home operations.
3. Pre-service training must include instruction in the principles and practices of Extension work.
4. Systematic in-service training is needed to ensure that Extension workers are supplied with the latest available subject matter information and are assisted in using Extension methods and media effectively.

Verma(97) indicated that pre-service training is, at best, an introduction to professional life. The social and educational changes which are taking place in society today at an increasingly accelerated rate render much of what we know obsolete much quicker than before. There is also much more to know, and there is increasing public scrutiny and demand to demonstrate higher levels of productive performance. In-service training programs, therefore have to be the basic mechanism for professional growth.

Chang(44) indicated that different levels of Extension personnel have different training requirements. Extension administrators, for example,

should be well trained in Extension philosophy, objectives and methods so that they could develop their organizations in the right perspective. Supervisors need to be trained in areas of supervision, as well as, technical subject matter areas since they help their workers plan and implement Extension program and assess the results of their work. He also defined three types of personnel training:

(a) Pre-service training concerns the training of personnel before they are employed by the Extension Service. An Extension worker is expected to have maturity, practical experience in agriculture and knowledge of how to approach and influence people and make his message understood by people. This aspect of training, therefore, will include technical subject matter, such as agriculture, and in process disciplines, such as Extension Education, rural organization and leadership training.

(b) Induction training is a period of orientation to the organization for a new appointee before assuming active duty. This training normally covers several weeks where a trainee undergoes experiences to familiarize himself with the structure, objectives and function of the organization. He will also be given the opportunity to work with an experienced agent, to be taken to his area of work and introduced to local leaders, authorities and progressive farmers.

(c) In-service training refers to training programs which are regularly held to keep agents up to date on technical knowledge and Extension methods. This training takes the form of conferences, workshops, seminars, etc. This type of training is usually held on

a regular basis so that new ideas and techniques can be introduced into the system.

Need for Training

A basic tenent in adult education philosophy according to Bruner (6) is that the participant must be offered what he wants to learn. Rahman (71) states that training tends to become sterile if it is not related to the prevalent conditions and needs of the society. The training need which an individual may express can be considered as felt need. Johnson indicated that in order for a need to be felt, a person had to have an appropriate sensitivity to his state and condition, some knowledge, and the ability to make a judgement or evaluation (20). Misra defined training needs as those improvements which should be brought about in employees to enable them to contribute their best to the success of the organization (29).

The Tyler rationale is based on a search for appropriate educational objectives based on the learner's needs. According to Tyler (77), learners needs are found by comparing desirable standards of behavior or acceptable norms to the present conditions of the learner. Leagans describes needs in terms of a gap. "Needs represent an imbalance, lack of adjustment, or gap between the present situation or status quo and a new or changed set of conditions assumed to be more desirable (62)".

The gap theory applied to this study represents the difference between the Agriculture Field Assistants' present level of cognitive ability in relation to selected concepts in Extension Education and related Social Sciences and a desired level of cognitive ability of these concepts. (See Figure III for a diagram of Need).

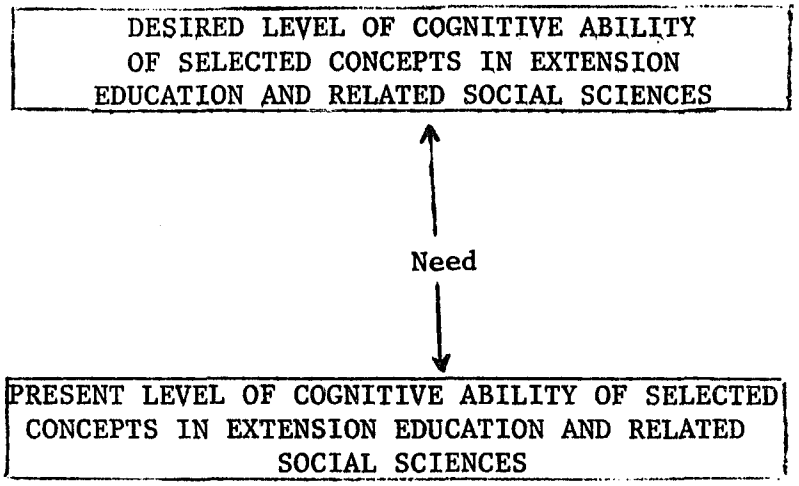


Figure III Need in Terms of Cognitive Ability of Selected Concepts in Extension Education and Related Social Sciences

Methods Used in Determining Training Needs and Results of Selected Studies on Training Needs

The various aspects of training needs have been researched by many educators both in the United States and in developing countries.

Flint(88) made a comprehensive study of the training needs of white Extension Service personnel in the Northern Extension District of Louisiana. Nine major areas of emphasis, based on the sub-committee report on the "scope of Cooperative Extension Service Responsibilities" and the competencies necessary for the implementation of the report, provided the basis for the selection of certain items for use in the study. Forty five items were related to the following nine areas: (1) program planning, (2) program execution, (3) evaluation, (4) efficiency in agricultural production and marketing, (5) farm and home management, (6) family living and youth development, (7) leadership, (8) community and resource development and (9) public affairs.

In his study Flint found that while Extension personnel had the greatest

need for training in the areas of public affairs, evaluation, leadership development, and efficiency in agricultural production and marketing. The following specific items were listed in order of their importance as perceived by the agents:

1. An understanding of the procedures used in evaluating an Extension program.
2. How to "build in" evaluation procedures into program plans.
3. How to develop one's own leadership ability.
4. A knowledge of public affairs, issues and problems as they relate to the Extension Service.
5. A knowledge of the techniques of selecting and training leaders.
6. An understanding of the process involved in the marketing (producers to consumer) of agricultural products.
7. How to involve people in the study and analysis of their problems.
8. How to develop teaching objectives to be used in the execution of an Extension project or program.
9. An understanding of the procedures involved in efficient agricultural production and marketing.
10. How to determine leadership resources within the group.
11. An understanding of the source of and efficient use of credit in farm and home management.

Santos(96) conducted a study on the scope of in-service training needs and the participation in in-service training programs by teachers of agricultural schools in the Philippines. His study involved twenty items, grouped in six areas, namely: (1) research and experimentation, (2) subject matter content, (3) Extension methods, (4) co-curriculum activities, (5) general education and (6) administration and supervision.

In his study Santos found that the priority of specific areas of training needed to be as follows:

1. Research and experimentation
2. Subject-matter content
3. Extension methods
4. Co-curriculum activities
5. General education
6. Administration and Supervision

Phanom(92) did a study on the training programs for Extension field workers in Thailand using a mail questionnaire. His study was based on age, status, official status, position, academic status, experience in Extension work and their expressed needs in the field of professional and human relations skills, Extension methodology and practices, and technical agriculture subject-matter. In his study Phanom found that two types of professional improvement were available:

1. Graduate study in Extension for those who had technical agricultural training at college level.
2. College education for persons who had high school equivalents.

In a study for determining training needs of Louisiana Extension agents in the area of Dairy Science, Verma(97) used Tyler's concept of educational objectives and Bloom's taxonomic classification of cognitive behavior, along with the element of work effectiveness, to build a conceptual framework. The data collected were analyzed based on two major dimensions, namely, agent cognitive ability and relative work value of dairy science concepts. The concepts related to breeding, nutrition and management were rated by the dairy agents and specialists in terms of importance in the job of the agent and were also tested on agents at three levels of

cognitive behavior.

In his study Verma found that there were discrepancies in the training needs between present and desired cognitive ability in Dairy Science concepts and that the parish agents showed more discrepancies than did the area agents. According to this study, the two types of agents had different training needs and this fact should be used in planning in-service training programs.

In a recent study by Saidin Teh(94) on the training needs of Malaysian Extension workers as perceived by selected Malaysian students at Louisiana State University, forty-four items covering the following areas were used in that study: (1) program planning, (2) program execution, (3) program evaluation, (4) agricultural production and marketing, (5) family living and youth development, (6) home management and nutrition, (7) public affairs, and (8) Extension related areas which included supervision, research and publication, and subject matter knowledge.

In his study Saidin found that Malaysian Extension workers needed strong training in the following areas:

1. Program planning
2. Agricultural production and marketing
3. Rural affairs and rural development
4. Public affairs
5. Leadership development
6. Program execution
7. Youth development and family living
8. Program evaluation

Bryant(85) did a survey of the Extension Service field staff in British Guiana to seek specific information with reference to the following:

1. The experience and training of Extension personnel,
2. The number and location of people served by Extension personnel.
3. The methods used by Extension personnel in carrying out their duties.
4. The problems of Extension personnel.
5. The in-service training needs of Extension personnel.

The major finding of the study was that one or two years of training in the Farm institute was not sufficient preparation for maximum effectiveness in Extension teaching. It was not possible to gain more than a perfunctory acquaintance with the broad field of agricultural technology in two years.

To remedy this condition, it was necessary to provide opportunity for in-service training in those areas of technical agriculture of particular importance to British Guiana conditions. Of equal importance in the development of an effective Extension Service is an understanding of the basic principles of Extension teaching which may be acquired during formal training in school or college, though in-service courses, or through experience.

A two week in-service training program in the basic principles of Extension was held in Georgetown as a result of this study and was attended by all except two Agriculture Field Assistants. Some of the topics dealt with were as follows:

1. How to use Visual Aids.
2. How to select and train local leaders
3. Result Demonostration
4. How to work with groups
5. Method Demonstration

6. How to hold a meeting.

7. How to work with rural youth

In the opinion of the Director of Agriculture, the Extension Officers, and the Director of Extension, the U.S.A.I.D. Food and Agricultural Officer and the Extension Advisor, as well as, the Agriculture Field Assistants themselves, the program was a big success.

Grisby(90) did a study of the in-service training needs of Agriculture Field Assistants in Guyana and developed a needs oriented, pragmatic program to meet these needs. Thirty of the Agriculture Field Assistants responded to the questionnaire and the majority indicated that the areas of program development and visual aids were the ones in which they desired intensive training.

After studying the other sources of information: personal and job profiles of the Agriculture Field Assistants, the current pre-service training program at the Guyana School of Agriculture, the Guyana Development Plan, and suggestions from the Agriculture Officers he decided that the Agriculture Field Assistants needed in-service training in the whole area of Extension Methodology. He proceeded to work in close consultation with the Agriculture Officers to plan an in-service training program which embodied the following objectives.

1. To develop an understanding of the agricultural education process of planning, education and evaluation.
2. To understand and be able to develop Extension programs.
3. To understand and be able to apply some of the more important concepts in educating adult farmers.
4. To understand the methods and process of communication.
5. To understand and be able to apply some of the more important

concepts of leadership.

6. To understand the role of visual aid in Extension Education.

The program was implemented in the major agricultural districts - Essequibo, Demerara and Berbice and was directed to the new Agriculture Field Assistants in particular. Sixty Agriculture Field Assistants participated in the program. The participants were divided into seven "Work Groups" and each group assigned a role in the development of materials to be included in a proposed handbook titled "Program Development Handbook - Guyana, South America".

In the opinion of the participants, the Extension administrative and professional staff of the Guyana Ministry of Agriculture, and the University of Florida, the in-service training program was successful. Two important things that were accomplished in the program were:

1. An outline of an Extension Program Development Handbook for Guyana.
2. A tentative plan of work for increasing the production of edible oils in Guyana.

Curriculum Development Research Model

The learning and curriculum theory discussed above were adapted to meet the particular training needs of front line Extension workers in Guyana. From curriculum theory, the Tyler model was chosen because it appears to be the most adaptable framework for examining and answering questions relating to the curriculum. This model indicates an initial value position with regard to educational objectives, then suggests logical comparisons and organization of the several means of attaining these objectives. Self correction is inherent in the evaluative process, within the limits set by the selected objectives.

The Tyler rationale suggests three sources of information for determining educational objectives: the learners, contemporary life, and suggestions from specialists. Information about the learner as a source of educational objectives was obtained by comparing the personal and job profiles of the Agriculture Field Assistants in Guyana who are the prospective learners. Additional information about the learner, as a source of educational objectives was obtained from analysis of their ratings of the importance of selected concepts to the performance of their job. Contemporary life as a source of information comprised examination of the current farming situation in Guyana, the agri-milieu, the agricultural development plan 1976-1980, the agri-support activities that are available, and the pre-service training programs for Agriculture Field Assistants that are currently being offered at the Guyana School of Agriculture. Suggestions from specialists consisted of their ratings of the importance of selected concepts to successful job performance by Agricultural Field Assistants,

their suggestions for improving the current pre-service training programs at the Guyana School of Agriculture, and their suggestions for improving the effectiveness of the Extension Service as a promoter of agricultural modernization in Guyana.

The educational objectives inferred from the three sources of information discussed above were screened and only those objectives relating to cognitive and affective behavioral changes necessary for effective Extension teaching on the part of the Extension workers in Guyana were selected. Objectives relating to development of psychomotor skills were not considered in the model as this domain was outside the scope of the study. The selected objectives were designed for Extension workers in Guyana to develop their knowledge, comprehension and ability to apply relevant concepts in Extension education and related social sciences.

The educational objectives designed to meet both the felt and unfelt training needs of Extension workers in Guyana were used as the standard or criteria by which content was selected. The content of the curriculum consisted of the 38 concepts from Extension Education and related Social Sciences. The objectives also served as the basis by which learning experiences were selected and organized to attain the specific objectives, and evaluations were conducted to assess the degree to which the specific objectives were attained.

(See Figure IV for Curriculum Development Research Model).

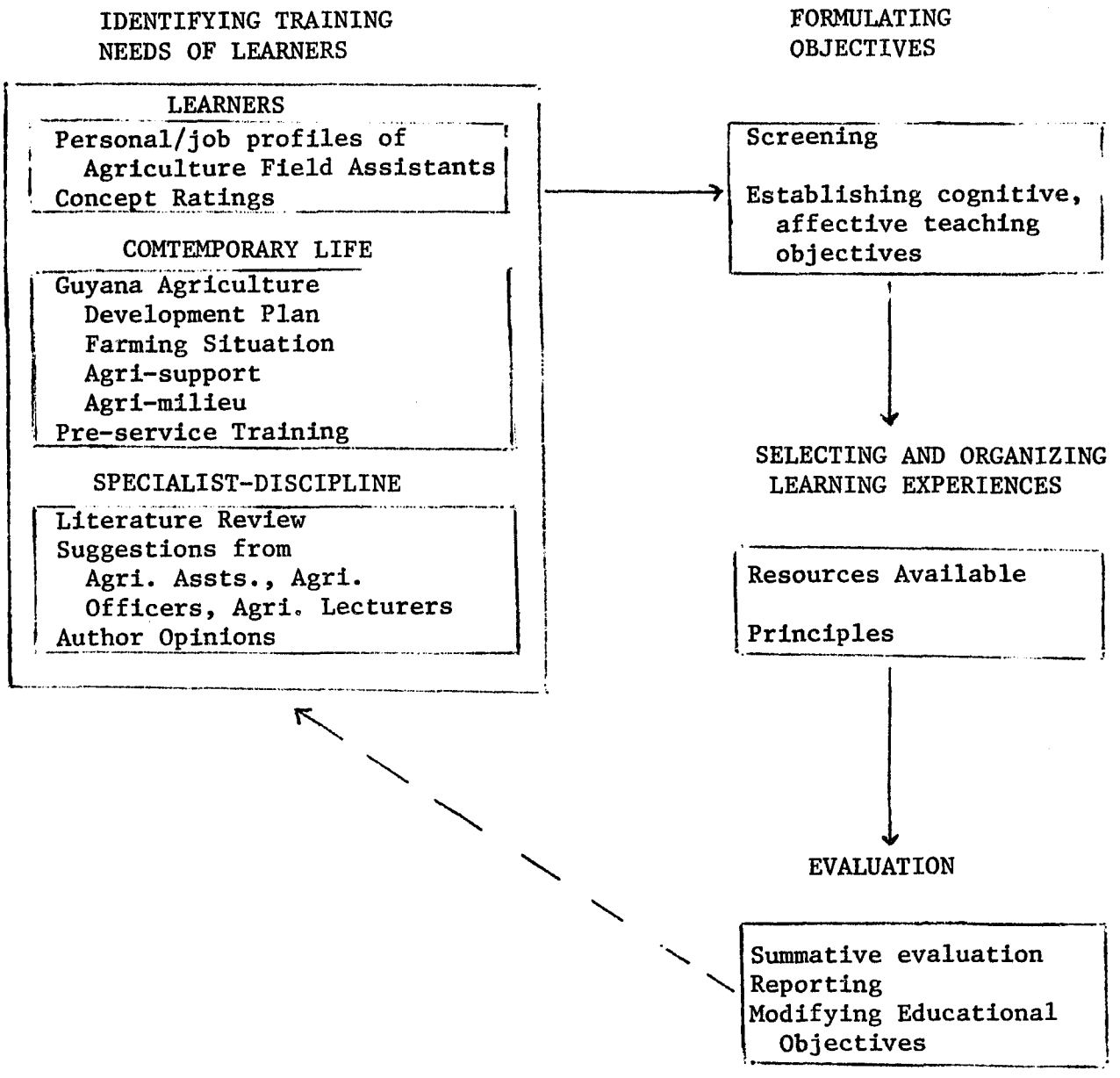


FIGURE IV CURRICULUM DEVELOPMENT RESEARCH MODEL

CHAPTER III

METHODOLOGY

The Collection of Data

The proposed curriculum is based on Tyler's model which involves four major components: determination of objectives, selection of suitable learning experiences, organization of learning experiences, and evaluation. In determining educational objectives three sources of information were used: the learners who in this study are the Agriculture Field Assistants, contemporary life of the learners which corresponds to the Guyana society, and the specialists who are the Agriculture Assistants and Agriculture Officers (Extension), as well as, the Agriculture Lectures from the Guyana School of Agriculture. Information from the learners and specialists were obtained by personal interviews, and information about comtemporary life of the Agriculture Field Assistants was obtained from literature about Guyana.

Two interview schedules were used to collect data for the purpose of inferring educational objectives in this study. One schedule which was designed to collect data from the Agriculture Field Assistants (the learners), consisted of three parts: the first part dealt with selected concepts from the Social Science disciplines which were thought to be useful to the Agriculture Field Assistant's job, the second part dealt with the Agriculture Field Assistant's job description, and the final part dealt with his personal data. The other schedule which was designed for the Agriculture Assistants and Agriculture Officers (Extension), and also for the Agriculture Lecturers from the Guyana School of Agriculture

also consisted of three parts. The first and last parts were similar to those in the schedule for the Agriculture Field Assistants, and the other part involved open questions for suggestions. The information used to develop both schedules was obtained from review of literature as well as from the researcher's personal experience.

After the interview schedules were developed, they were sent to the Principal of the Guyana School of Agriculture for pre-testing. Six Agriculture Field Assistants, one Agriculture Assistant and two Agriculture Officers (Extension), as well as, three Agriculture Lecturers from the Guyana School of Agriculture were included in the pre-test. Based on the responses reviewed, questions which were ambiguous and misleading were modified. After these adjustments, the schedules were again pre-tested using three students from the College of Agriculture of Louisiana State University who were formerly Agriculture Field Assistants in Guyana. The corrections which were made resulted in schedules which were relatively easy to understand.

The collection of data by personal interviews was done by the author himself from the three categories of personnel connected with Extension work and Agricultural Education in Guyana. The population consisted of 104 Agriculture Field Assistants, 16 Agriculture Assistants and Agriculture Officers (Extension), and 24 Agriculture Lecturers from the Guyana School of Agriculture. The interview sample consisted of 74 Agriculture Field Assistants, 12 Agriculture Assistants and Agriculture Officers (Extension) and 16 Agriculture Lecturers. It was not possible to contact the others during the three week period (July 14th to August 5th), the researcher was in Guyana to conduct the interviews.

The sample of the study represented 71 per cent of the total population. The proportions in the three categories of personnel indicated

above were 72, 75 and 66 per cent respectively.

The collected data were coded for analysis at the Computer Research Center of the Louisiana State University.

Selection and Organization of Learning Experience and the Evaluation Process

These three components of the Tyler Model were addressed largely from the standpoint of the researcher's personal experience of the situation in Guyana. Factual information, therefore, was minimal, if any. Inferences and suggestions included in the training design for the achievement of educational objectives in the curriculum were made basically upon personal knowledge and value judgements.

Analysis of Data

The data gathered in the study were analyzed to develop a personal profile and a job profile of the Agriculture Field Assistants and to establish educational objectives for the proposed curriculum.

The personal profile and job profile were based on several variables which were analyzed to determine simple frequencies and means.

The analysis with regard to the establishment of the curriculum objectives was basically concerned with:

(a) determining the relative job importance of the several proposed concepts for the curriculum as viewed by the Agricultural Field Assistants, and the Agriculture Assistants and Agriculture Officers (Extension) and Agriculture Lecturers of Guyana School of Agriculture.

(b) comparing these groups to determine statistically significant

differences in their perceptions of the importance of these concepts to the job of the Agriculture Field Assistants. Analysis of Variance was used as the statistical procedure and the results were considered statistically significant at the .05 level of probability.

CHAPTER IV

THE PROPOSED CURRICULUM

The proposed curriculum for in-service training of Agriculture Field Assistants in Guyana was developed on the basis of the research model for this study. This model represented in large measure Tyler's rationale for curriculum development.

Inferring Curriculum Objectives

The first element of the model was related to the establishment of curriculum objectives. Three sources of information are recommended for this purpose. As related to the study, the three sources were (a) Agriculture Field Assistants in the Guyana Extension Service as the prospective learners, (b) contemporary life in Guyana, particularly the Extension Service in which the Agriculture Field Assistants have to live and work, and (c) the specialists and the disciplines concerned with Extension work - the Agricultural Assistants and Agriculture Officers in the Extension Service, and the Agriculture Lectures in the Guyana School of Agriculture; and the relevant discipline concepts selected from a search of literature.

A set of 38 concepts considered by the author as essential for the Agriculture Field Assistants to function as educators was abstracted from the literature. These concepts were presented to the learners and specialists and their reactions obtained regarding the importance of these concepts to the job of the Agriculture Field Assistants. Other information relevant to the inferring of educational objectives were the personal

and job characteristics of the learners, suggestions from specialists, and a review of literature pertaining to farming, agri-support activities, and the agri-milieu in Guyana.

Personal Profile of the Agriculture Field Assistants

Age - The study indicates that 55 per cent of the Agriculture Field Assistants interviewed were below the age of 30, 40 per cent were between the ages of 30 and 40, and only 5 per cent were older than 40. These figures showed that the front-line Extension workers in Guyana were relatively young and could be of invaluable service to the country.

Sex - Extension in Guyana was traditionally a man's job, and according to the study, 84 per cent of the Agriculture Field Assistants interviewed were males and 16 per cent were females. Women had always been a great asset to Extension and more of them should be encouraged to join the Extension Service.

Education - The study showed that 70 per cent of the Agriculture Field Assistants who were interviewed had the Diploma in General Agriculture prior to their employment in the Extension Service, 25 per cent had the Certificate, 4 per cent had the Bachelor's Degree and 1 per cent had no specific qualifications. After they were employed 19 per cent of the Agriculture Field Assistants received specialized training in Animal Science, 15 per cent in Home Economics, 3 per cent in Agricultural Economics, and 1 per cent in Agronomy. None of the Agriculture Field Assistants interviewed received specialized training in Extension Education and related Social Sciences although training in these disciplines are essential for effective Extension work.

Experience - The majority of Agriculture Field Assistants were not

only young, but also inexperienced. The study showed that 57 per cent of the Agriculture Field Assistants who were interviewed had less than five years experience, 38 per cent had between five and ten years experience, and 5 per cent had between 10 and 18 years experience.

Organizational Participation - The study showed that 12 per cent of the Agriculture Field Assistants who were interviewed belonged to teaching organizations and 23 per cent belonged to various social organizations. There was no agricultural organization to which they could belong.

Job Profile of the Agriculture Field Assistants

Position and Responsibilities

The position of the Agriculture Field Assistants determined the type of responsibilities that were assigned to them. For example, only Grade I Agriculture Field Assistants were placed incharge of Demonstration Stations. The study showed that of the Agriculture Field Assistants interviewed, 59 per cent were classified as Grade I, 26 per cent were classified as Grade II, and 15 per cent were classified as Livestock Assistants.

Tables I and II present a composite picture of the job profile of the Agriculture Field Assistants. Table I shows the mean percentage of working time the Agriculture Field Assistants devoted to the various Extension job functions in 1976, and Table II shows the mean number of times per year (1976) the Agriculture Field Assistants performed various job activities.

The data in Table I show that the Agriculture Field Assistants devoted an average of 30 per cent of their working time performing the educational task of teaching and advising farmers, planning and reporting, while 42 per cent was spent on non-educational tasks of supervising labor, selling farm supplies and record keeping, and other miscellaneous duties. Twenty eight per cent of the time indicated for planning and reporting.

could be related to both the educational and non-educational or service components of the job.

Table I

MEAN PERCENTAGE OF WORKING TIME THE AGRICULTURE FIELD ASSISTANTS DEVOTED TO VARIOUS JOB FUNCTIONS, GUYANA 1976

Job Functions	Percentage of Time	
	Mean	Range
Teaching and advising farmers	30	20-50
Supervision of labor	24	10-35
Planning	19	15-30
Selling agricultural supplies and record keeping	10	5-20
Reporting	9	5-20
Other functions	8	5-25

The data in Table II show that the Agriculture Field Assistants contacted farmers through visits and meetings most frequently, and performed educational support activities, such as data collection, reporting, planning, etc. at a level commensurate with the educational task. It was interesting that they attended in-service training and seminars only three times in the year, but consulted technical material and specialists more frequently. In summary, it would appear that the role of the Agriculture Field Assistants is partly educational and partly rendering of services and assistance to the farmers. It is not possible to infer from the data the relative importance of these role functions. It is surmised, however, considering the stage of agricultural development in the country that the service function may be taking precedence over the educational function.

Table II

MEAN NUMBER OF TIMES VARIOUS ACTIVITIES WERE PERFORMED BY AGRICULTURE FIELD ASSISTANTS, GUYANA IN 1976

Job Activities	Number of times per year (1976)	
	Mean	Range
Visit with farmers	204	100-386
Organize farmers meetings	63	10-130
Collect data	61	24- 99
Visit school gardens	29	0- 60
Consult college notes, reference books, and journals	19	0- 99
Other functions	18	0- 50
Consult specialists	15	0- 40
Write reports	15	10- 36
Attend staff meetings	12	8- 24
Prepare plans of work	7	0- 9
Write teaching plans	7	0- 9
Organize and consult advisory committees	6	0- 9
Attend in-service training and seminars	3	0- 6
Develop Extension programs	1	0- 3

Work Importance of Concepts

Thirty-eight concepts selected from Extension Education and related social sciences were evaluated to determine their Extension work importance by the potential learning group of Agriculture Field Assistants and the specialist groups of Agriculture Assistants and Agriculture Officers (Extension) and the Agriculture Lecturers from the Guyana School of Agriculture. A comparative ranking of the concepts based on the overall means calculated from a 4-3-2-1 scale of work importance is presented in Table III. The weights on the scale parallel judgements of the respondents whether the concepts were absolutely necessary, very useful, fairly useful, or only slightly useful in the job performance of the Agriculture Field Assistants.

Table III

WORK IMPORTANCE OF SELECTED CONCEPTS IN EXTENSION EDUCATION AND RELATED SOCIAL SCIENCES BASED ON THE OVERALL MEAN VALUES CALCULATED FROM A 1-2-3-4 SCALE OF WORK IMPORTANCE

Concepts	Overall Mean (N= 102)	Concepts	Overall Mean (N= 102)
Planning	3.88	Data Collection	3.40
Communications	3.75	Behavior	3.40
Evaluation	3.72	Teaching Objectives	3.39
Extension Program	3.71	Values	3.39
Motivation	3.70	Role Perception	3.37
Need	3.66	Teaching Plan	3.37
Timeliness	3.64	Group	3.36
Program Objective	3.64	Responsibility	3.36
Education	3.61	Art of Interviewing	3.36
Teaching Technique	3.59	Learning Experiences	3.34
Teaching Method	3.58	Supervision	3.29
Teaching	3.53	Role	3.27
Learning	3.53	Reinforcement	3.22
Culture	3.50	Concept	3.20
Innovation	3.50	Authority	3.13
Social Change	3.50	Advisory Committee	3.11
Social Organization	3.50	Organization of Learning Experiences	3.09
Plan of Work	3.49	Structured Observation	3.08
Norms	3.43	Transfer of Learning	2.99

The concept planning with an overall Mean of 3.88 was rated the highest by the three groups of respondents and the concept transfer of learning with an overall Mean of 2.99 was rated the lowest. However, the range of the ratings from 3.88 to 2.99 was rather narrow. Based on the rating scale of 4, 3, 2, 1 for responses of absolutely necessary, very useful, fairly useful and slightly useful respectively, it was observed that 16 of the concepts were considered to be absolutely necessary for the job of the Agriculture Field Assistants and the other 22 were considered to be very useful.

The set of 38 concepts were classified in six major content areas for the purpose of analysis. These areas were:

1. Teaching and Learning
2. Program Development
3. Extension Evaluation
4. Educational Psychology
5. Sociology Concepts
6. Management Concepts

Teaching and Learning Concepts (Table IV):

In this group communication with an overall Mean of 3.75 was rated highest and Concept with an overall Mean of 3.20 was rated lowest. Also, based on the overall Means, the concepts Communication, Education, Teaching Technique, Teaching Method, Teaching, and Learning could be considered as being absolutely necessary for the job of the Agriculture Field Assistants; and the concepts Behavior, Learning Experience and Concept could be considered as being very useful.

A comparison of the Mean ratings of each concept by the three groups of respondents revealed that the concepts communication and concept were rated highest by the Agriculture Field Assistants; and the concepts Education, Teaching Techniques, Teaching Method, Teaching, Learning, Behavior and Learning Experiences were rated highest by the Agriculture Assistants and Agriculture Officers. None of the concepts were rated highest by the Agriculture Lecturers. In fact, six concepts in this area were rated lowest by the Agriculture Lecturers.

The Analysis of Variance procedure indicated that there were highly statistically significant differences among the Mean ratings of the three groups of respondents with respect to the concepts Learning and Learning Experiences. No statistically significant differences were observed

among the three groups with respect to the other seven concepts. In other words, all three groups of respondents had similar reactions with regard to the importance of the other seven concepts.

Table IV

A COMPARISON OF THE PERCEPTIONS OF THE WORK IMPORTANCE OF TEACHING-LEARNING CONCEPTS BY JOB ASSIGNEMENT OF SELECTED AGRICULTURAL PERSONNEL IN GUYANA, 1977

Teaching Learning Concepts	Rating of Work Importance of Concept by Job Assignment (Mean Values) (a)					
	Overall (N=102)	Agri. Field Assistant (N=74)	Agri. Asst. Agri. Officer (N=12)	Agri. Lecturers (N=16)	F (b)	P
Communication	3.75	3.77	3.67	3.69	0.41	0.67
Education	3.61	3.58	3.92	3.50	2.54	0.08
Teaching Technique	3.59	3.58	3.67	3.56	0.18	0.83
Teaching Method	3.58	3.53	3.83	3.69	1.94	0.14
Teaching	3.53	3.53	3.75	3.44	1.23	0.29
Learning	3.53	3.46	4.00	3.56	5.29	0.006
Behavior	3.40	3.38	3.75	3.25	3.01	0.05
Learning Experiences	3.34	3.28	3.83	3.19	6.93	0.001
Concept	3.20	3.22	3.17	3.13	0.14	0.86

(a) Means calculated from a 1-2-3-4 scale of work importance
(b) with 2 and 99 d.f.

Program Development Concepts (Table V)

In this group the concept Extension Program with an overall Mean of 3.71 was rated the highest and Organization of Learning Experiences with an overall Mean of 3.09 was rated the lowest. Also based on the overall Means, the concepts Extension Program, Need, and Program Objectives could be considered as being absolutely necessary for the job of the Agriculture Field Assistants, and the concepts Plan of Work, Teaching Plan, Teaching Objectives, Advisory Committee, and Organization of Learning Experiences very useful.

A comparison of the Mean ratings of each concept by the three groups of

respondents revealed that all eight concepts were rated highest by the group of Agriculture Assistants and Agriculture Officers. Also, three of the concepts were rated lowest by the Agriculture Lecturers.

The Analysis of Variance procedure indicated that at the .05 level of probability there were statistically significant differences among the Mean ratings of the three groups of respondents with respect to the concepts Program Objectives and Teaching Objectives. There were no statistically significant differences among the Mean ratings of the three groups with respect to the other six concepts. In other words, there is homogeneity in the opinions of all three groups of respondents as to how important these six concepts are to the job of the Agriculture Field Assistants.

Table V

A COMPARISON OF THE PERCEPTIONS OF THE WORK IMPORTANCE OF PROGRAM DEVELOPMENT CONCEPTS BY JOB ASSIGNMENT OF SELECTED AGRICULTURAL PERSONNEL IN GUYANA, 1977

Program Development Concepts	Rating of Work Importance of Concepts by Job Assignment (Mean Values)(a)					
	Overall (N=102)	Agri. Field Assistant (N=74)	Agri. Asst. Agri. Officer (N=12)	Agri. Lecturers (N=16)	F(b)	P
Extension Program	3.71	3.70	3.92	3.56	2.10	0.12
Need	3.66	3.70	3.75	3.44	2.13	0.12
Program Objective	3.64	3.65	3.92	3.38	4.31	0.01
Plan of Work	3.49	3.43	3.75	3.56	2.32	0.10
Teaching Objective	3.39	3.31	3.75	3.50	4.20	0.01
Teaching Plan	3.37	3.30	3.67	3.50	2.65	0.07
Advisory Committee	3.11	3.03	3.33	3.25	2.07	0.12
Organization of Learning Expereinces	3.09	2.96	3.75	3.13	8.72	0.0006

(a) Means calculated from a 1-2-3-4 scale of work importance
(b) with 2 and 99 d.f.

Extension Evaluation Concepts (Table VI)

In this group Evaluation with an overall Mean of 3.72 was rated highest and Structured Observation with an overall Mean of 3.08 was rated lowest. Also, based on the overall Means the concept evaluation could be considered as being absolutely necessary for the job of the Agriculture Field Assistants; and the concepts Data Collection, Art of Interviewing and Structured Observation very useful.

A comparison of the Mean ratings of each concept by the three groups of respondents revealed that all four concepts were rated highest by the Agriculture Field Assistants and three of the concepts were rated lowest by the Agriculture Lecturers.

The Analysis of Variance procedure indicated that at the .05 level of probability there were statistically significant differences among the Mean ratings of the three groups of respondents with respect to the concept Art of Interviewing.

Table VI

A COMPARISON OF THE PERCEPTIONS OF THE WORK IMPORTANCE OF EXTENSION EVALUATION CONCEPTS BY JOB ASSIGNMENT OF SELECTED AGRICULTURE PERSONNEL IN GUYANA, 1977

Extension Evaluation Concepts	Rating of Work Importance of Concepts by Job Assignement (Mean Values) (a)					
	Overall (N=102)	Agri. Field Assistant (N=74)	Agri. Asst. Agri. Officer (N=12)	Agri. Lecturers (N=16)	F(b)	P
Evaluation	3.72	3.73	3.67	3.69	0.12	0.88
Data Collection	3.40	3.45	3.42	3.19	1.22	0.29
Art of Interviewing	3.36	3.42	3.33	3.06	3.51	0.03
Structured Observation	3.08	3.14	3.00	2.81	2.14	0.12

(a) Means calculated from a 1-2-3-4 scale of work improtance
(b) with 2 and 99 degrees of freedom

Educational Psychology Concepts (Table VII)

In this group Motivation with an overall Mean of 3.70 was rated highest and Transfer of Learning with an overall Mean of 2.99 was rated lowest. Also, based on the overall Means the concepts Motivation and Timeliness could be considered as being absolutely necessary for the job of the Agriculture Field Assistants; and the concepts Reinforcement, Transfer of Learning, and Role Perception very useful.

A comparison of the Mean ratings of each concept by the three groups of respondents showed that the concepts Motivation and Transfer of Learning were rated highest by the Agriculture Field Assistants, and the other three concepts were rated highest by the Agriculture Assistants and Agriculture Officers. None of the concepts were rated highest by the Agriculture Lecturers. In fact, three of the concepts were rated lowest by the Agriculture Lecturers.

The Analysis of Variance procedure indicated that at the .05 level of probability, there were statistically significant differences among the Mean ratings of the three groups of respondents with respect to the concepts Motivation and Timeliness. There were no statistically significant differences among the Mean ratings with respect to the other three concepts.

Sociology Concepts (Table VIII)

In this group Culture, Social Organization, and Social Change with the same overall Mean of 3.50 were rated highest and the concept Role with an overall Mean of 3.27 was rated lowest. Also, based on the overall Means the concepts Culture, Social Organization, and Social Change

Table VII

A COMPARISON OF THE PERCEPTIONS OF THE WORK IMPORTANCE OF EDUCATIONAL PSYCHOLOGY CONCEPTS BY JOB ASSIGNMENT OF SELECTED AGRICULTURE PERSONNEL IN GUYANA, 1977

Educational Psychology Concepts	Rating of Work Importance of Concepts by Job Assignment (Mean Values)(a)					
	Overall (N=102)	Agri. Field Assistant (N=74)	Agri. Asst. Agri. Officer (N=12)	Agri. Lecturers (N=16)	F (b)	P
Motivation	3.70	3.77	3.67	3.44	3.09	0.04
Timeliness	3.64	3.69	3.75	3.31	3.20	0.04
Role Perception	3.37	3.30	3.75	3.38	3.13	0.04
Reinforcement	3.22	3.18	3.58	3.19	2.53	0.08
Transfer of Learning	2.99	3.03	2.92	2.88	0.83	0.55

(a) Means calculated from a 1-2-3-4 scale of work importance.
(b) with 2 and 99 degrees of freedom

Table VIII

A COMPARISON OF THE PERCEPTIONS OF THE WORK IMPORTANCE OF SOCIOLOGY CONCEPTS BY JOB ASSIGNMENT OF SELECTED AGRICULTURAL PERSONNEL IN GUYANA, 1977

Sociology Concepts	Rating of Work Importance of Concepts by Job Assignment (Mean Values)(a)					
	Overall (N=102)	Agri. Field Assistant (N=74)	Agri. Asst. Agri. Officer (N=12)	Agri. Lecturers (N=16)	F (b)	P
Culture	3.50	3.55	3.58	3.19	3.60	0.03
Social Organization	3.50	3.50	3.67	3.31	1.35	0.26
Social Change	3.50	3.59	3.33	3.13	4.68	0.01
Norms	3.43	3.46	3.67	3.06	6.51	0.002
Values	3.39	3.39	3.58	3.25	1.60	0.20
Group	3.36	3.35	3.50	3.25	0.74	0.51
Role	3.27	3.31	3.42	3.00	3.09	0.04

(a) Means calculated from a 1-2-3-4 scale of work importance.
(b) With 2 and 99 degrees of freedom

could be considered as being absolutely necessary for the job of the Agriculture Field Assistants; and the other four concepts could be considered as being very useful.

A comparison of the Mean ratings of each concept by the three groups of respondents revealed that the concept Social Change was rated highest by the Agriculture Field Assistants; and the other six concepts were rated highest by the Agriculture Assistants and Agriculture Officers. None of the concepts were rated highest by the Agriculture Lecturers. In fact all seven concepts were rated lowest by the Agriculture Lecturers.

The Analysis of Variance procedure indicated that at the .05 level of probability, there were statistically significant differences among the Mean ratings of the three groups of respondents with respect to the concepts Culture, Social Change and Role. With respect to the concept Norm the differences were highly statistically significant at the .01 level. There were no statistically significant differences among the Mean ratings of the three groups with respect to the other three concepts.

Management Concepts (Table IX)

In this group Planning with an overall Mean of 3.88 was rated highest and Authority with an overall Mean of 3.13 was rated lowest. Also, based on the Overall Means, the concepts Planning and Innovation could be considered as being absolutely necessary for the job of the Agriculture Field Assistants; and the concepts Supervision, Authority and Responsibility very useful.

A comparison of the Mean ratings of each concept by the three groups of respondents revealed that the concepts Planning and Responsibility were rated highest by the Agriculture Field Assistants, and the concepts

Supervision, Innovation, and Authority were rated highest by the Agriculture Assistants and Agriculture Officers. None of the concepts were rated highest by the Agriculture Lecturers. In fact, two of the concepts were rated lowest by the Agriculture Lecturers.

The Analysis of Variance procedure indicated that at the .05 level of probability, there were statistically significant differences among the Mean ratings of the three groups of respondents with respect to the concept Innovation. However, there were no statistically significant differences among the Mean ratings of the three groups with respect to the other four concepts.

Table IX

A COMPARISON OF THE PERCEPTIONS OF THE WORK IMPORTANCE OF MANAGEMENT CONCEPTS BY JOB ASSIGNMENT OF SELECTED AGRICULTURE PERSONNEL IN GUYANA, 1977

Management Concepts	Rating of Work Importance of Concepts by Job Assignment (Mean Values)(a)					
	Overall (N=102)	Agri. Field Assistant (N=74)	Agri. Asst. Agri. Officer (N=12)	Agri. Lecturers (N=16)	F	P (b)
Planning	3.88	3.89	3.83	3.88	0.14	0.86
Innovation	3.50	3.53	3.67	3.19	3.49	0.03
Responsibility	3.36	3.38	3.33	3.25	0.31	0.73
Supervision	3.29	3.24	3.42	3.38	0.72	0.50
Authority	3.13	3.11	3.25	3.13	0.45	0.64

(a) Mean calculated from a 1-2-3-4 scale of work importance.
(b) With 2 and 99 d.f.

Based on the preceding analysis of data, the following inferences were made which guided the further development of the curriculum:

1. Comparative analysis of the personal and job profiles of the Agriculture Field Assistants revealed that most of them had a relatively strong background in technical agriculture. However, they had little or no training in Extension Education. It would be obvious, therefore, that since their major job function is teaching, they should be provided with necessary training in Extension Education.
2. Analysis of the overall Means in Tables IV, V, and VII revealed that Concept had the lowest overall Mean among the Teaching and Learning Concepts, Organization of Learning Experiences had the lowest overall Mean of the Program Development Concepts, and Transfer of Learning had the lowest overall Mean among the Educational Psychology Concepts. This relationship leads to the conclusion that the value of concept learning is not yet fully realized by educators in Guyana. It would appear, therefore, that the value of concept learning should be emphasized and demonstrated to educational administrators and educators in the Guyana School of Agriculture. This will create a favorable climate for the proposed curriculum, which is heavily dependent on this type of learning approach.
3. Analysis of the overall Means in Table III revealed that 16 of the concepts were considered as absolutely necessary for the job of the Agriculture Field Assistants and the other 22 were considered as very useful. It was therefore inferred that all 38 concepts be included in the curriculum.

4. Analysis of the overall Mean ratings of the concepts by the three groups of respondents revealed that the Agriculture Field Assistants had the highest Mean ratings for 11 concepts; and the Agriculture Assistants and Agriculture Officers had the highest Mean ratings for the other 27 concepts. The Agriculture Lecturers on the other hand had the lowest Mean rating for 26 of the 38 concepts. This led the author to conclude that Agriculture Lecturers, not being in constant contact with field conditions may not have as deep a perception of the type of training required by front-line Extension workers. It was inferred, therefore, that there should be a higher degree of correlation between what is required in the field and what is taught at the Guyana School of Agriculture.

Educational Objectives of the Curriculum

The inferences drawn from the analyses of the personal and job profiles of the Agriculture Field Assistants, and the selected concepts in Extension Education and related Social Sciences provided a rational basis for the formulation of teaching objectives to meet the training needs of Agriculture Field Assistants in Guyana. The following were the teaching objectives of the curriculum.

1. Given a list of 38 concepts from Extension Education and related Social Sciences, the Agriculture Field Assistant will be able to recall (write) the definition of each concept without the aid of references.
2. Given a list of 38 concepts from Extension Education and related Social Sciences, the Agriculture Field Assistant will be able to

write a short paragraph explaining the context in which each concept is used and its value to Extension. References may be used.

3. Working under the supervision of an Extension specialist the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to develop and implement an Extension program for his district.
4. Working under the supervision of an Extension specialist the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to develop and use a plan of work and a teaching plan.
5. Working under the supervision of an Extension specialist the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to evaluate his Extension program prepare a report of his evaluation, and use the findings of his evaluation to improve his program.

Curriculum Content

Six major concept areas in Extension Education and related Social Sciences which appeared to be needed by the Agriculture Field Assistants to attain the educational objectives stated above were as follows:

1. Extension Teaching and Learning.
2. Extension Program Development.
3. Extension Evaluation.
4. Educational Psychology Concepts.
5. Rural Sociology Concepts
6. Management Concepts.

The six major concept areas listed above would, therefore, form the core content of the curriculum. They were designed to develop cognitive and affective abilities in the Agriculture Field Assistants with regard to the following areas:

1. Increased understanding of the theories of teaching and learning.
2. Increased understanding of the principles, objectives and philosphy of Extension education. This would include the role of Extension and other agri-support activities in facilitating social, economic, and technological adjustments necessary for agricultural modernization.
3. Increased understanding and proficiency in the application of concepts in Extension Education and related Social Science disciplines in planning, executing, and evaluating Extension educational programs.
4. Development of those qualities of personal leadership necessary for effective Extension teaching.
5. Development of a spirit of inquiry and recognition of the need for continued intellectual development throughout life.

Learning Experiences

The learning experiences which were selected to develop awareness and interest in concept learning; and knowledge, comprehension and application of selected concepts in Extension Education and related Social Sciences were as follows:

1. Lectures and group discussions in the classroom.
2. Library research.
3. Seminars and group discussions.

4. Field Workshops.

The selection and organization of the four learning experiences suggested above would depend on the judgement of the instructor, which would be influenced by such factors as his leadership ability, the needs of the students, the subject matter, the equipment and materials available, and the physical environment in which learning would take place. However, an effort would be made to ensure continuity, sequence, integration and timeliness in the organization process.

Evaluation

Since the purpose of evaluation is to see how far objectives are actually being realized, the process of evaluation of the proposed curriculum would begin with the stating of the objectives. Two other evaluations would be made - one at the end of the program to measure changes that have taken place, and the other some time after the teaching has been completed to assess permanence of behavioral change. The results of the evaluation would be used to identify inadequacies in the curriculum and make necessary improvements.

CHAPTER V

SUMMARY AND CONCLUSIONS

The Problem and Its Setting

Guyana is a newly independent, tropical country situated on the north east shoulder of South America. It has a total area of 83,000 square miles of which only one-tenth is developed, and a population of 750,000 that is increasing at a rate of 3.5 per cent per annum. If Guyana is to maintain its place among the developing countries of the world it needs to expedite its current rate of agricultural development.

Like most other newly independent nations, Guyana's economy is very heavily dependent on agriculture. Together with agri-industrial products, fisheries and forestry, agriculture provides 38 per cent of Guyana's national income, employs 40 per cent of the labor force, and constitutes more than 66 per cent of the total exports. However, over 20 per cent of the Guyana's food requirements were imported during 1976, and the country's need for the substitutuion of imported food supplies is added to the need to achieve a three or four per cent annual increase in agricultural output over the next 10 to 15 years in order to diversify agricultural production and provide employment for a rapidly growing population.

Since independence in 1966, the Government has been allocating considerable amounts of capital to promote modernization of the nations agriculture. The results, however, were very modest because of a number of constraints, among which was a lack of well trained Agriculture Field Assistants who could integrate the various agri-support activities and

provide effective educational service in the farming communities.

Agriculture Field Assistants are currently being trained at the Guyana School of Agriculture. This institution, which was established in 1963, offers four types of training programs - a two-year pre-service diploma program in General Agriculture for intended Agriculture Field Assistants, a two year certificate program of a practical nature in General Agriculture for intended model-farmers, a one-year in-service diploma program in Vocational Agriculture for qualified teachers, and short courses for farmers in specialized areas such as Pest Control and the like.

Both the diploma and certificate graduates of the Guyana School of Agriculture are General Agriculturist by training, and in recent years because of shortage in staff both of these two categories of graduates were being employed by the Extension Service as Agriculture Field Assistants without any additional training in Extension Education. Also, in recent years a number of Agriculture Field Assistants were given in-service training in various aspects of technical agriculture such as Livestock Husbandry, but very few of them were given in-service training in Extension Education and related Social Sciences.

The problem in this study, therefore, was to develop a curriculum in Extension Education and related Social Sciences to supplement the General Agriculture Curriculum that is currently being used at the Guyana School of Agriculture. It was considered rational to assume that in a country like Guyana with such a diverse cultural mosaic, and such a pressing need to move small farmers from traditional subsistence level farming to modern commercial agriculture, there is an imminent need for front-line Extension workers with strong backgrounds in both technical agriculture and educational change.

Purpose

The purpose of this study was to develop a needs oriented, pragmatic curriculum in Extension Education and related Social Sciences for in-service of Agriculture Field Assistants in Guyana . To realize this over-all purpose the following specific objectives were established:

1. To develop a personl profile of Agriculture Field Assistants based on their age, sex, educational background, experience and organizational affiliation.
2. To develop a job profile of Agriculture Field Assistants characterized by job tasks assigned and performed, and areas of specialization.
3. To select and screen a set of concepts as to their Extension work importance.
4. To review literature pertaining to the Agri-milieu in Guyana.
5. To analyze data and infer educational objectives for an in-service training curriculum for Agriculture Field Assistants.
6. To design a curriculum based on the Tyler model to develop knowledge, comprehension, and application levels of cognitive abilities, as well as, positive affective abilities in the Agriculture Field Assistants.
7. To suggest a training package to achieve the curriculum objectives.

Methodology

Three curriculum development models were considered in this study - Leagans' rationale for Extension teaching in developing countries, Tyler's rationale for classroom instruction, and Walker's empirical model of the

process of curriculum development. The Tyler rationale was chosen for this study because most curriculum questions can justifiably be placed within his framework or legitimately be translated in his terms.

In accordance with Tyler's rationale, three sources of information were examined to determine educational objectives - the personal and job profiles of the Agriculture Field Assistants who are the prospective learners; the political, economic and cultural aspects of Guyana's society in which the Agriculture Field Assistants work and live; and suggestions from Agriculture Assistants and Agriculture Officers, as well as, the Agriculture Lecturers who are the specialists. Information from the learners and specialists were obtained by personal interviews, and information about contemporary life was obtained from literature review about the agri-milieu in Guyana.

In order to determine the cognitive and affective behavioral changes needed on the part of the Agriculture Field Assistants, a set of 38 concepts, considered to be important by the author, was abstracted from the literature. These concepts were presented to the learners and specialists and their reactions obtained regarding the importance of these concepts to the job of the Agriculture Field Assistants. Other information relevant to the inferring of educational objectives were the personal and job characteristics of the learners, suggestions from specialists and a review of literature pertaining to farming, agri-support activities, and the agri-milieu in Guyana.

Two interview schedules were developed for use in this study - one for the learners and the other for the specialist group. After the interview schedules were developed they were sent to the Principal of the Guyana School of Agriculture for pre-testing. Six Agriculture Field Assistants,

one Agriculture Assistant, two Agriculture Officers, and three Agriculture Lecturers were involved in the first pre-test. Based on the responses received, questions which were ambiguous and misleading were modified. After the adjustments were made the schedules were again pre-tested using three students from the College of Agriculture of Louisiana State University who were formerly Agriculture Field Assistants in Guyana. The corrections which were made resulted in schedules which were relatively easy to understand.

The collection of data was done by the author himself from the three categories of personnel connected with Extension work and Agricultural Education in Guyana. The population consisted of 104 Agriculture Field Assistants, 16 Agriculture Assistants and Agriculture Officers, and 24 Agriculture Lecturers. The interview sample consisted of 74 Agriculture Field Assistants, 12 Agriculture Assistants and Officers, and 16 Agriculture Lecturers.

The sample of the study represented 71 per cent of the total population. The proportions in the three categories of personnel indicated above were 72, 75 and 66 per cent respectively.

The collected data were coded for analysis at the Computer Research Center of the Louisiana State University. The analysis of the data for Means and Analysis of Variance provided a rational basis for the establishment of educational objectives. Learning experiences were selected to attain the specified objectives and evaluation procedures were suggested to assess the degree to which the specified objectives were attained.

Major Findings

1. Pre-service training at the Guyana School of Agriculture provide the Agriculture Field Assistants with a relatively strong back-

ground in General Agriculture, but with very limited training in Extension Education and related Social Sciences.

2. It appeared that the value of concept learning as an approach to education was not fully realized by educational administrators and educators in the Guyana School of Agriculture.
3. It appeared that all 38 concepts in Extension Education and related Social Sciences, which were considered essential by the author for the job of the Agriculture Field Assistants, could be included in the curriculum.
4. It appeared that the Agriculture Lecturers not being in constant contact with field conditions might not have had as deep a perception of the type of training required by front-line Extension workers as did the Agriculture Field Assistants and the Agriculture Assistants and Agriculture Officers (Extension).

The Suggested Curriculum

Educational objectives - The major findings of the study provided a rational basis for the formulation of teaching objectives to meet the training needs of Agriculture Field Assistants in Guyana. The following teaching objectives were established for the curriculum:

1. Given a list of 38 concepts from Extension Education and related Social Sciences, the Agriculture Field Assistant will be able to recall (write) the definition of each concept without the aid of references.
2. Given a list of 38 concepts from Extension Education and related Social Sciences, the Agriculture Field Assistant will be able to

write a short paragraph explaining the context in which each concept is used and its value to Extension. References may be used.

3. Working under the supervision of an Extension specialist the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to develop and implement an Extension program for his district.
4. Working under the supervision of an Extension specialist the Agriculture Field Assistant will be able to apply the concepts in Extension Education and related Social Sciences to develop and use a plan of work and a teaching plan.
5. Working under the supervision of an Extension Specialist the Agriculture Field Assistant will be able to apply concepts in Extension Education and related Social Sciences to evaluate his Extension program, prepare a report of his evaluation, and use the findings of his evaluation to improve his program.

Curriculum Content - Six major concept areas in Extension Education and related Social Sciences which appeared to be needed by the Agriculture Field Assistants to attain the educational objectives of the curriculum were as follows:

1. Extension Teaching and Learning
2. Extension Program Development
3. Extension Evaluation
4. Educational Psychology Concepts
5. Rural Sociology Concepts
6. Management Concepts.

These six major concept areas would, therefore, form the core content

of the curriculum.

Learning Expereince - The learning expereinces which were selected to develop awareness and interest in concept learning; and knowledge, comprehension and application of selected concepts in Extension Education and related Social Sciences were as follows:

1. Lectures and group discussions in the classroom.
2. Library research
3. Seminars and group discussions
4. Field workshops.

The selection and organization of the four learning experiences suggested above would depend on the judgement of the instructor, which would be influenced by such factors as: his leadership ability, the needs of the students, the subject matter, the equipment and materials available, and the physical environment in which the learning would take place. However, an effort would be made to ensure continuity, sequence, integration and timeliness in the organization process.

Evaluation- Since the purpose of evaluation is to see how far objectives are actually being realized, the process of evaluation of the proposed curriculum would begin with the stating of the educational objectives. Two other evaluations will be made - one at the end of the program to measure changes that had taken place, and the other some time after the teaching had been completed to assess permanence of behavioral change. The success of this program, in the final evaluation, would be assessed by the ability of the graduates of the in-service training program to lead small farmers from traditional subsistence type of farming to modern commercial agriculture.

Implementation - With regard to the conditions that currently exist in Guyana this curriculum could be implemented at the Guyana School of Agriculture where the staff and other facilities used for the pre-service training programs could be utilized for the in-service training program. There might also be value in having several kinds and levels of training in the same institution concurrently. This type of interaction not only would serve to eliminate status barriers among Agriculture Field Assistants to communication, but also provide different perspectives to the same problems.

The Guyana School of Agriculture should continue to provide pre-service training of Agriculture Field Assistants. However, with the integration of this curriculum, it will need to modify its existing programs - to make them more diverse in terms of courses offered concurrently, and also more continuous with training planned over a long period of time. Instead of providing terminal diploma and certificate programs, it will need to redesign its programs for continuing education with regard to on-the-job training in the districts and in-service training at the Guyana School of Agriculture.

Conclusions

No one will deny that the future of agricultural development in Guyana will be greatly dependent upon technically and well trained Extension personnel. The following conclusions are based on the findings of the study and on recommendations from specialists.

1. The Guyana Extension Service does not have an explicitly stated philosophy. However, based on its activities it appears that its current philosophy is to advise as well as assist farmers on

various aspects of agricultural production. This is an old philosophy to Extension and is not effective enough to bring about the changes needed in a newly independent developing nation. It is recommended, therefore, that Guyana adopt the modern philosophy of teaching farmers relevant concepts, skills and values so that they will be able to help themselves.

2. The scope of Extension in Guyana is limited to agricultural production, home economics and youth development; with the greatest emphasis on agricultural production. If Guyana is to modernize its agriculture by moving small farmers from traditional subsistence type of farming to modern commercial agriculture it will be necessary for Extension in Guyana to expand its scope to include management, conservation and marketing.
3. Almost all the new Agriculture Field Assistants in the Ministry of Agriculture are currently being trained at the Guyana School of Agriculture. The pre-service training for Agriculture Field Assistants provided by this institution are mostly in the technical agricultural areas such as rice, sugarcane, livestock and vegetables. The dilemma with this type of training is that the graduates are better prepared to work with animals and plants and are poorly prepared to deal with people which is a prerequisite for successful Extension work. It is necessary, therefore, that they be provided with in-service training in Extension Education and related Social Science areas such as Rural Sociology, Educational Psychology, and Management. In-service training needs to be a continuous process to keep the Agriculture Field Assistants motivated and informed of new developments in their profession. The new Faculty of

Agriculture at the University of Guyana can play a significant role in helping to attain this goal.

4. The Extension Service has a relatively young and inexperienced field staff largely because of the high employment turnover within that Division of the Ministry of Agriculture. Most of the young graduates from the Guyana School of Agriculture usually serve their professional apprenticeship with the Extension Service and after acquiring experience a large number secure employment with other sections of the Ministry of Agriculture or other governmental agencies where the working conditions are more lucrative. It is suggested, therefore, that the conditions of employment in the Extension Service be improved by providing Agriculture Field Assistants with better facilities in the area of housing, salaries, out-of-district allowances, interior-allowances, teaching aids, scholarships and the like. Unless the Agriculture Field Assistants are satisfied with their conditions of employment they will not be motivated to perform their duties with maximum efficiency no matter how closely they are supervised.
5. The ultimate goal of both pre-service and in-service training for Agriculture Field Assistants is to prepare them to function effectively as change agents in the farming communities. The training they undergo disciplines and equips them with the necessary concepts, skills and values to plan and conduct effective educational programs with small farmers to move them from traditional subsistence level farming to modern commercial agriculture, and this is what constitutes development.

Small farmers in Guyana, however, like small farmers everywhere,

are difficult to change. They are difficult to change because of the risks involved. It is suggested, therefore, that in order to facilitate change, Agriculture Field Assistants must not only perform an educational function, but also integrate the various agri-support activities that are available in their districts. To facilitate the adoption of a recommended practice for example, the Agriculture Field Assistant must be able to get the "taught-about" fertilizer or seeds to the waiting farmers when they need it.

Agriculture support activities that are available in Guyana are as follows:

1. Research to produce new and improved agricultural technology.
2. Extension to communicate new technology to the small farmers and to teach them how to adopt it.
3. Land Development to provide everyone who would like to farm with a viable holding.
4. Credits to finance the purchase of materials and supplies needed for commercial agriculture.
5. Materials and supplies such as reliable seeds of new crop varieties, fertilizers, small machinery and the like available at prices the small farmers can afford.
6. Markets where small farmers can get satisfactory prices for their produce.
7. Organizations such as cooperatives where small farmers can attempt to do collectively what they cannot accomplish individually.

It is the ability of the Agriculture Field Assistant to integrate these agri-support activities with his educational function that will

result in agricultural modernization and this will determine the success of the training program in the final evaluation.

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A P P E N D I C E S

APPENDIX A

LOUISIANA STATE UNIVERSITY & AGRICULTURAL & MECHANICAL COLLEGE

INTERVIEW SCHEDULE

Agriculture Field Assistants (Extension)

Part I--Ideas:

The following are selected ideas in Extension and related disciplines which are used by Extension workers in the United States and in other countries where Extension has progressed. Please study these ideas very carefully and then rate them as to how important you feel they are for Agriculture Field Assistants in Guyana to understand them and be able to use them in their work. Indicate your rating of each idea by marking a check (✓) on the appropriate dotted line provided on the right hand side of the page.

Extension Teaching

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
1. Education--a change in behavior, e.g. a change in attitude.	.....	.....	.....	.....
2. Teaching--Selecting, organizing, and providing learners with experiences that will evoke desirable changes in their behavior	.....	.....	.....	.....
3. Learning--Process of change in the learners' behavior as a result of being exposed to certain experiences.	.....	.....	.....	.....

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
4. Learning Experiences--Interaction between the learner and factors in his environment to which he reacts by making changes in his behavior.	.....	.....	.....	.....
5. Behavior--Anything that an individual learns. involves knowledge, skills, values, and attitudes.	.....	.....	.....	.....
6. Teaching Method--Way in which learners are organized in order to participate in an educational acitivity, e.g. a meeting	.....	.....	.....	.....
7. Teaching Technique--Actual participation by the learners in an educational activity, e.g. a group discussion	.....	.....	.....	.....
8. Concept--An abstract idea used to simplify thinking by including a number of ideas under one heading	.....	.....	.....	.....
9. Communication--Interchange of ideas and information among people	.....	.....	.....	.....
Extension Program Development				
10. Extension Program--Educational plan for some specified period of time, e.g. Extension Program for 1977-1980.	.....	.....	.....	.....
11. Plan of Work--Schedule of educational activities for some specified period of time	.....	.....	.....	.....

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
12. Teaching Plan--Plan of instruction for each lesson	.....	.....	.....	.....
13. Need--Situation in which the behavior of the learner is not what is expected, e.g. when a farmer is not adopting a recommended practice there is a need to change.	.....	.....	.....	.....
14. Program Objective--Changes in behavior of the learner that we hope to accomplish by the program	.....	.....	.....	.....
15. Teaching Objectives--Changes in behavior of the learner that we hope to accomplish by each lesson	.....	.....	.....	.....
16. Advisory Committee--An elected or selected group of individuals who advise the Extension worker on matters pertaining to needs, objectives, and program development	.....	.....	.....	.....
17. Organization of Learning Experiences--Arranging learning experiences so that they reinforce each other and have maximum benefit to the learner	.....	.....	.....	.....
Extension Evaluation				
18. Evaluation--Determining what behavioral changes have occurred by judging the extent to which educational objectives have been reached	.....	.....	.....	.....

	Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
19.	Data Collection--Devices used to collect data for evaluation purposes, e.g. mailed questionnaires, interviews.	.....	.....	.....	.....
20.	Art of Interviewing--Way an interview is conducted so as to elicit the correct responses to the questions asked	.....	.....	.....	.....
21.	Structured Observation--Collecting data by observation when the observer knows what aspects of behavior to observe and record	.....	.....	.....	.....
	Educational Psychology				
22.	Timeliness--Teaching is most effective when the learner is psychologically ready for learning by feeling the need, e.g. teaching farmers about insecticides when there is a pest problem	.....	.....	.....	.....
23.	Motivation--The inspiration or desire in a person to accomplish certain objectives	.....	.....	.....	.....
24.	Reinforcement--A person's change in behavior becomes more permanent if he is exposed to the same learning sxperiences repeatedly	.....	.....	.....	.....
25.	Transfer of Learning--Relating what is learned in one discipline to what is learned in other diciplines	.....	.....	.....	.....

	Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
26.	Role Perception--The way a person sees and interprets his job determines how he behaves on the job.	.....	.....	.....	.....
	Sociology				
27.	Culture--Thw way of life a society, e.g. Guyanese culture	.....	.....	.....	.....
28.	Values--Assumptions of what is right and important in a culture	.....	.....	.....	.....
29.	Norms--Rules of behavior patterns in a culture	.....	.....	.....	.....
30.	Social Organization--Organized pattern of social interaction in a social system, e.g. a farming community	.....	.....	.....	.....
31.	Group--People in interaction face to face and having common goals	.....	.....	.....	.....
32.	Role--The part a person plays because of his position in the social system	.....	.....	.....	.....
33.	Social Change--Alterations in Social organization	.....	.....	.....	.....
	Management				
34.	Planning--Determination of objectives and means to achieve objectives	.....	.....	.....	.....
35.	Supervision--Guiding and encouraging employees to achieve objectives	.....	.....	.....	.....

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
36. Innovation--Development of new ideas and ways to get things done	.....	.....	.....	.....
37. Authority--Power vested in a person by virtue of his competence or position	.....	.....	.....	.....
38. Responsibility--The obligation to use authority to see that duties are performed	.....	.....	.....	.....

Part II Job Description

Please answer the following questions by marking a check (✓) on the appropriate dotted line provided or by filling in the blanks.

39. Are you in charge of a demonstration station? a. Yes .....

b. No.....

40. What percent of your working time are you required to spend on the following type of responsibilities?

40a. Supervision of labor _____%

40b. Planning _____%

40c. Teaching and advising farmers _____%

40d. Selling and record keeping _____%

40e. Reporting _____%

40f. Other (please specify) _____%

Total = _____%

41. In what subject area are you doing Extension work?

41a. Agriculture.....

41b. Home Economics.....

41c. Other (please sepcify).....

42. How many times during the year 1976 did you perform the following activities as a part of your job? (Your annual report may be helpful).

Activities	No. of Times Performed
42a. Develop Extension Program	_____
42b. Prepare plans of work	_____
42c. Write teaching plans	_____
42d. Collect data	_____
42e. Write reports	_____
42f. Consult college notes-reference books and journals	_____
42g. Consult specialists	_____
42h. Organize and consult advisory committees	_____
42i. Attend in-service training and seminars	_____
42j. Attend staff meetings	_____
42k. Visit with farmers	_____
42l. Organize meetings	_____
42m. Visit school gardens	_____
42n. Others (Please specify)	_____

43. To what extent would you say your college courses in Extension Education have been useful to you in your work?

Extremely Useful ..... Very Useful ..... Somewhat Useful ..... Not Useful .....

44. With your experience, to what extent do you feel that in-service training in Extension Education will be useful in helping you to become a better Extension worker?

Extremely Useful ..... Very Useful ..... Somewhat Useful ..... Not Useful .....

Part III Personal Data

Please answer the following questions by filling in the blanks:

45. Name (Optional) _____

46. Age _____

47. Sex _____

48. Present Position _____

49. Office Address _____

50. Education:

	Schools Attended	Qualifications Gained
50a.	Elementary _____	_____
50b.	Secondary _____	_____
50c.	Technical _____	_____ Major _____
50d.	College _____	_____ Msjor _____
50e.	University _____	_____ Major _____

51. Experience:

	Organizations for which you worked	For How Long (years & months)	Nature of work
51a.	_____	_____	_____
51b.	_____	_____	_____
51c.	_____	_____	_____
51d.	_____	_____	_____
51e.	_____	_____	_____

52. Organizations to which you belong as a member:

	Names of Organization	Position Held, if any
52a.	_____	_____
52b.	_____	_____
52c.	_____	_____

APPENDIX B

LOUISIANA STATE UNIVERSITY & AGRICULTURE & MECHANICAL COLLEGE

INTERVIEW SCHEDULE

Agriculture Assistants, Agricultural Officers (Extension)
and
Agriculture Lecturers
(Guyana School of Agriculture)

Part I--Ideas:

The following are selected ideas in Extension and related disciplines which are used by Extension workers in the United States and in other countries where Extension has progressed. Please study these ideas very carefully and then rate them as to how important you feel they are for Agriculture Field Assistants in Guyana to understand them and be able to use them in their work. Indicate your rating or each idea by marking a check (✓) on the appropriate dotted line provided on the right hand side of the page.

Extension Teaching

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
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2. Teaching--Selecting, organizing, and providing learners with experiences that will evoke desirable changes in their behavior.	.....	.....	.....	.....

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
3. Learning-Process of change in the learners' behavior as a result of being exposed to certain experiences.	.....	.....	.....	.....
4. Learning Experiences--Interaction between the learner and factors in his environment to which he reacts by making changes in his behavior.	.....	.....	.....	.....
5. Behavior--Anything that an individual learns. Involves knowledge, skills, values, and attitudes.	.....	.....	.....	.....
6. Teaching Method--Way in which learners are ogranized in order to participate in an educational activity, e.g. a meeting	.....	.....	.....	.....
7. Teaching Technique--Actual participation by the learners in an educational activity, e.g. a group discussion	.....	.....	.....	.....
8. Concept--An abstract idea used to simplify thinking by including a number of ideas under one heading	.....	.....	.....	.....
9. Communication--Interchange of ideas and information among people	.....	.....	.....	.....
Extension Program Development				
10. Extension Program--Educational plan for some specified period of time, e.g. Extension Program for 1977-1980.	.....	.....	.....	.....

	Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
11.	Plan of Work--Schedule of educational activities for some specified period of time	.....	.....	.....	.....
12.	Teaching Plan--Plan of instruction for each lesson	.....	.....	.....	.....
13.	Need--Situation in which the behavior of the learner is not what is expected, e.g. when a farmer is not adopting a recommended practice there is a need to change	.....	.....	.....	.....
14.	Program Objective--Changes in behavior of the learner that we hope to accomplish by the program	.....	.....	.....	.....
15.	Teaching Objectives--Changes in behavior of the learner that we hope to accomplish by each lesson	.....	.....	.....	.....
16.	Advisory Committee--An elected or selected group of individuals who advise the Extension worker on matters pertaining to needs, objectives, and program development	.....	.....	.....	.....
17.	Organization of Learning Experiences--Arranging learning experiences so that they reinforce each other and have maximum benefit to the learner	.....	.....	.....	.....

Extension Evaluation

18.	Evaluation--Determining what behavioral changes have occurred by judging the extent to which educational objectives have been reached.	.....	.....	.....	.....

	Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
19.	Data Collection--Devices used to collect data for evaluation purposes, e.g. mailed questionnaires, interview	.....	.....	.....	.....
20.	Art of Interviewing--Way an interview is conducted so as to elicit the correct responses to the questions asked	.....	.....	.....	.....
21.	Structured Observation--Collecting data by observation when the observer knows what aspects of behavior to observe and record	.....	.....	.....	.....

Educational Psychology

22.	Timeliness--Teaching is most effective when the learner is psychologically ready for learning by feeling the need, e.g. teaching farmers about insecticides when there is a pest problem	.....	.....	.....	.....
23.	Motivation--The inspiration or desire in a person to accomplish certain objectives	.....	.....	.....	.....
24.	Reinforcement--A person's change in behvaior becomes more permanent if he is exposed to the same learning experience repeatedly	.....	.....	.....	.....
25.	Transfer of Learning--Relating what is learned in one discipline to what is learned in other disciplines	.....	.....	.....	.....

	Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
26.	Role Perception--The way a person sees and interprets his job determines how he behaves on the job	.....	.....	.....	.....
	Sociology				
27.	Culture--The way of life of a society, e.g. Guyanese culture	.....	.....	.....	.....
28.	Values--Assumptions of what is right and important in a culture	.....	.....	.....	.....
29.	Norms--Rules of behavior patterns in a culture	.....	.....	.....	.....
30.	Social Organization--Organized pattern of social interaction in a social system, e.g. a farming community	.....	.....	.....	.....
31.	Group--People in interaction face to face and having common goals	.....	.....	.....	.....
32.	Role--The part a person plays because of his position in the social system	.....	.....	.....	.....
33.	Social Change--Alterations in social organization	.....	.....	.....	.....
	Management				
34.	Planning--Determination of objectives and means to achieve objectives	.....	.....	.....	.....
35.	Supervision--Guiding and encouraging employees to achieve objectives	.....	.....	.....	.....

	Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
36.	Innovation--Development of new ideas and ways to get things done	.....	.....	.....	.....
37.	Authority--Power vested in a person by virtue of his competence or position	.....	.....	.....	.....
38.	Responsibility--The obligation to use authority to see that duties are performed	.....	.....	.....	.....

Part II Suggestions

During the last ten years, the Guyana School of Agriculture has done a fine job in training Agriculture Field Assistants for all sections of the Ministry of Agriculture. However, there is always room for imporvement. Please offer suggestions for same.

39. In addition to the ideas listed in Part I, of this questionnaire what other ideas in Extension and realted disciplines you feel Agriculture Field Assistants working in Extension Service need to understand and be able to use? Please rate the ideas you suggest according to their relative usefulness.

Ideas	Absolutely Necessary	Very Useful	Fairly Useful	Slightly Useful
_____	.....	.....	.....	.....
_____	.....	.....	.....	.....
_____	.....	.....	.....	.....
_____	.....	.....	.....	.....
_____	.....	.....	.....	.....

40. The Guyana School of Agriculture offers pre-service training in general agriculture to all Agriculture Field Assistants. What aspects of the curriculum of the Guyana School of Agriculture do you feel need to be supplemented in in-service training for Agriculture Field Assistants who are working in the Extension Service?

_____

_____

_____

41. What suggestions can you offer for improving the Extension Service in Guyana?

_____

_____

_____

Part III Personal Data

Please answer the following questions by filling in the blanks:

42. Name (optional) _____

43. Age _____

44. Sex _____

45. Present Position _____

46. Office Address _____

47. Education:

Schools Attended	Qualifications Gained
47a. Elementary _____	_____
47b. Secondary _____	_____
47c. Technical _____	_____
47d. College _____	_____
47e. University _____	_____

48. Experience:

	Organizations for which you worked	For How Long (years & months)	Nature of Work
48a.			
48b.			
48c.			
48d.			
48e.			

49. Organizations to which you belong as a member:

	Names of Organization	Position Held, if any
49a.		
49b.		
49c.		

VITA

The author was born at No. 61 Village, Guyana. He received his elementary education at the No. 56 Village Presbytarian School and his secondary education at the Skeldon Lutheran High School. He graduated from high school in June 1962 with the Cambridge Senior School Certificate and the London General Certificate of Education.

He was employed by the Ministry of Education from September 1962 to August 1964. In September 1964 he entered the Guyana School of Agriculture and graduated with a Diploma in Agriculture in June 1966. He returned to his job with the Ministry of Education in September 1966, and was transferred to the Extension Service in January 1967. In February 1968 he joined the Sugar Producers' Association.

He entered the Louisiana State University in September 1969 and financed his education by working as a Laboratory Animal Technician with the Department of Zoology. After completing his Masters Degree in December 1972, he was awarded a Graduate Research Assistantship, on the basis of his academic performance, to work and study towards the Doctorate Degree. In November 1974 he was employed by the Louisiana Cooperative Extension Service as an Assistant County Agent in Community Resource Development. He migrated to Canada in December, 1975 and is currently employed by the Marketing Division of Echlin Limited.

Mr. Niamjit Poonai is married to the former Miss Saraswattie Manohar. They have a son, Naveen, aged 6, and a daughter, Aarti, aged 3.

EXAMINATION AND THESIS REPORT

Candidate: Niamjit Poonai

Major Field: Extension Education

Title of Thesis: A Proposed Curriculum in Extension Education for In-Service Training of Agriculture Field Assistants in Guyana

Approved:

Satish Verma
Major Professor and Chairman

James D. Traynham
Dean of the Graduate School

EXAMINING COMMITTEE:

Russell L. Miller

Edward W. Glassie

T. A. Adams

Antonio S. Acharon

Date of Examination:

April 3, 1978